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ABSTRACT

Every administrator bears primary responsibility for planning the acccmplishment of those objectives and activities that fall in his area. When responsibility is relatively restricted, the informal and intuitive methods that constitute "sound judgment" suffice. However, as his area of responsibility widens to include increasingly ccmplex tasks more formal methods of planning and control may be needed. As, for example, when planning for or controlling whcle systems of activities (such as a school district), when the activities are new or experimental, or when large sums of money are to be expended. A vast literature exists on methods of planning for systems, for "comprehensive planning." Many of the ideas and methods found in the contemporary literature are discussed and evaluated in the first part of this report. An extensive annotated biblicgraphy follows, with five main sections covering planning process information; system-wide planning methods; system characteristics and qualities; politics, community, implementation and communicatcns; and, finally, other relevant bibliographies. The report concludes with author and subject indexes. (Author/GS)

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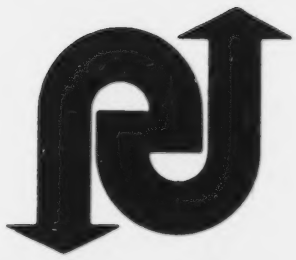
An Evaluation Of

Comprehensive Planning Literature

With An Annotated Bibliography



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An Evaluation of Comprehensive Planning Literature With an Annotated Bibliography

Sanford Temkin

September, 1970

PREFACE

Every administrator bears a primary responsibility for planning the accomplishment of those objectives and activities that fall in his area of responsibility. When responsibility is relatively restricted in extent, an administrator can well use the informal and intuitive methods that constitute "sound judgement;" however, as his area of responsibility widens to include tasks of increasing complexity, he may feel that it would be useful to implement more formal methods of planning and control. When the administrator is responsible for planning or controlling whole systems of activities (such as a school district) or when the activities are themselves new or experimental or when large sums of money are to be expended, then the use of one or another formal planning process may become necessary in order to maintain the desired degree of control.

A vast literature exists on methods of planning for systems, for "comprehensive planning." It is hoped that those who are involved in system-wide planning will find something of use to them in this publication.

The first section discusses and evaluates many of the ideas and methods that are to be found in the contemporary literature on comprehensive planning. Since, in this young field of study, accepted standards for evaluation of various ideas and methods do not exist, it must be confessed that the author's subjective judgements have of necessity influenced the presentation.

An annotated bibliography constitutes the second section. The items there have been selected by the author for their potential usefulness to those

responsible for comprehensive planning. Often an abstract, prepared by the author of an item, was available. In those cases the author's abstract was accepted as an annotation. Credit for the remaining annotations belongs to Lewis Polin. Joan Rosenstein and Elenore Pritchard provided editorial assistance. Loretta Margulies and Shakuntala Asnani handled typing and logistics for the project in their usual efficient manner.

Sanford Temkin
September, 1970

ORGANIZATION AND USE OF THIS BIBLIOGRAPHY

The arrangement of this bibliography is classified into five general categories. The categories are 1.0, PLANNING PROCESS INFORMATION; 2.0, SYSTEM WIDE PLANNING METHODS; 3.0, SYSTEM CHARACTERISTICS AND QUALITIES; 4.0, POLITICS, COMMUNITY, IMPLEMENTATION AND COMMUNICATION; 5.0, BIBLIOGRAPHY. Each category is subdivided, e.g., 4.1 is Politics and Community and 4.2 is Politics - Implementation. Within each subdivision the references are listed alphabetically by author. Author and subject indexes follow the annotated bibliography section. The author index refers the reader to the appropriate page number in the annotated bibliography section. The subject index indicates the item number where the subject can be found, e. g., 4.1.2 indexes the second article of subdivision 4.1.

Fleur Weinberg, Librarian

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AN EVALUATION OF THE LITERATURE OF COMPREHENSIVE PLANNING

The term "comprehensive" has meanings which are easily confused. On the one hand, it is always possible to include more information in the planning process and thus label the process as more comprehensive. On the other hand, the word, may be employed in a completely different sense. But before considering this other meaning it is necessary to define the term "system." A system may be defined as a set of mutually dependent activities which is directed towards a set of objectives common to all those activities. The term comprehensive in its second sense refers to a planning process which determines and evaluates alternative decisions within the total context of the set of shared objectives. As used in this monograph the term comprehensive, then, does not denote a concern for more information about a school district per se, but a concern for that information which allows one to view a district's operations as being directed toward a set of objectives common to all the activities of the district.

The indispensible elements of a process are called "necessary and sufficient conditions." Planning processes have indispensible types of information. The nature and specific interrelationships among these types of information depend upon what the planning process is designed to achieve. There are several ways to attempt to identify the types of data that are indispensible for a comprehensive planning process. The first approach selected by this writer was to use mathematics to select the types of data necessary to achieve the best possible fulfillment of all the objectives of the system, given the restraints imposed by the resources available. Another

way to identify indispensible types of information would be to read comprehensive planning literature in the hope that they could be recognized empirically and intuitively. Yet another way would be to consult with experienced planners and planning theoreticians. In actuality, all three approaches influenced this paper. The types of data that are needed for a comprehensive planning process are:

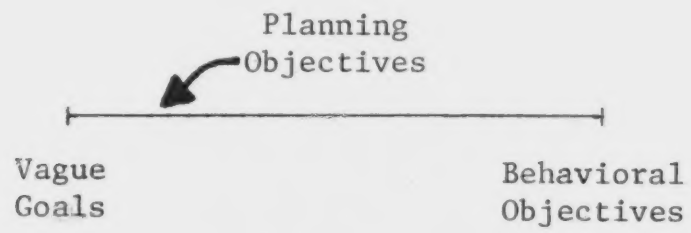
1. A set of planning objectives (or overall objectives) of the whole system.
2. Information about the relative importance ("weight") that various people involved in the system believe is appropriate for the different planning objectives.
3. At least one indicator of how the degree of attainment of each objective is to be judged (a "performance indicator").
4. Information about the potential importance of various programs and activities to each of the planning objectives (an approximation to the concept of the "production function").
5. Performance outcomes for each performance indicator.
6. Costs.

There are two considerations that arise when one discusses these types of data. First there are questions about measurement and data collection techniques. Second there are questions about relationships among types of data, i.e., the synthesis, or how to "put it all together." Information types are discussed in these two regards. References are made to particular bibliographical items that are annotated in the main body of this monograph.

Page numbers refer to the reference's page number in the annotated bibliography.

Planning objectives or overall objectives

If one visualizes a line that has vague goals at the extreme left and behavioral objectives at the extreme right, planning objectives are found "about 2/10" of the way from the left extreme (see sketch). Planning



objectives are a higher order abstraction in relation to very specific instructional objectives and as such play a different role in planning. Planning objectives have a single function - to allow the operations of the school district to be placed in a network of relationships for subsequent planning and discussion. This approach contrasts with one that is somewhat widely held - namely that objectives to be useful must be measurable. It is true that measurement is important; but, measurement should be reserved for the criteria of performance, which have the function of determining the extent to which a given activity has done what it was intended to do for the system as a whole.

The Downey study (p. 16) has the most to say about goals and objectives; the Educational Testing Service study (p. 15), prepared for the Pennsylvania Department of Education, has generated a great deal of performance data for "ten goals of education" since 1965; and the Radnor paper (p. 16) represents

a recent statement by a small suburban district that is interested in objectives, performances, and planning for change.

Assignment of weights to planning objectives

As one reads about decision-making and listens to decision-makers, a clear message emerges - priorities are all important in planning. This writer must disagree with certain implications of this conclusion. Deciding on priorities may be important to "get a feel for things" but they are not all important in the planning process. For instance, picture a decision-maker with three objectives which have been ranked in terms of their priorities. Does he allocate resources exclusively to the highest priority objective? If not, how much does he allocate to the highest priority objective before he allocates resources to the middle priority objective? Or does he allocate some resources to each objective? If so, how?

These questions can be answered partially by an assignment of relative weights to the planning objectives. Once this notion is accepted then a host of other questions emerge. Some of these are:

1. How can weights be obtained from people?
2. Can weights be obtained from both individuals and groups?
3. Are these weights really measurements?
4. How do the weights obtained from one person compare to those obtained from another?

There are three groups of methods for obtaining assignment of relative importance or preference from people. The Churchman-Ackoff Method may be applied to individuals or groups. The method forces the subject to consider

and reconsider the relative importance of objectives singularly and in combination. Hopefully, the subject is able to generate a set of internally consistant assignments of importance to each objective. This method and variations of it are common in the literature - see, for instance, Churchman, Ackoff and Arnoff (p. 18); and Stimson (p. 22).

The Neumann-Morgenstern Cardinal Utility approach has been used primarily by economists and statisticians. It centers on an individual's responses to selected proposals. These proposals are usually stated in terms of dollar return and probability of accomplishment. A good description of the method can be found in Baumol (p. 18), while a worthwhile empirical study of individual utility functions can be found in Grayson's classic study (p. 20) of decision-making practices in the oil-well drilling industry.

The Delphi Method first appeared in the literature around 1963. Essentially, it is designed for group judgements and arrives at consensus by using a series of steps. In each step subjects are told the results of judgements made at the end of the previous step. Those people who maintain extreme judgements justify their positions for others to evaluate. By this procedure consensus is ultimately achieved. Although this method is currently extremely popular very little had been done to explore its assumptions until recently. Norman Dalkey, one of the Delphi innovators, recently has discussed some of these assumptions (p. 18), while Rescher (p. 21) provides additional insight into the subtleties of the method.

Since judgements of relative importance (weights) obtained from one person cannot be added or subtracted from those obtained from another, interpersonnel utility comparisons cannot be handled directly. The best solution

would seem to be that of avoiding summing individual utility functions. Accordingly, any evaluation of alternatives for purposes of allocating resources would be done for a specific set of weighted planning objectives. This would mean that each time a set of preferences is introduced a new allocation of resources would result. When the preferences of many individuals or groups are to be explicitly considered, computer processing is undoubtedly required.

The Churchman-Ackoff Method claims to meet the basic additivity and transitivity assumptions for measurement. Baumol indicates Neumann-Morgenstern indexes also meet these requirements. As was indicated earlier there is still much to be learned about the Delphi Method.

This author feels that measurement theory and methodology lag far behind the need for practical real-world methods.

Another domain which may be addressed with regard to preference assignments is that of pupil needs, an area in which little has been done. Standard economic theory indicates that the best distribution of budgetary funds among all activities occurs when the additional usefulness of each dollar for an individual are proportional to the prices he pays. These, so-called, "marginal utilities" are assumed to represent a situation in which the individual's needs are satisfied. School districts also have a budget to allocate and it would seem reasonable to take into consideration pupil needs. As one examines the literature there is frequent mention of "meeting the needs of kids" but there is very little to guide someone on how to assess these needs. In this author's opinion the most sensible approach, is the study by Campbell and Markle at the Far West Laboratory

for Educational Research and Development (p. 13) and Mirsky's work on "pupil-event analysis" (p. 14).

Hopefully, data on pupil needs would serve as input into the process by which assignments of relative importance to overall objectives would be determined and represented. It is argued by this author, that perhaps a meaningful arrangement can emerge as various community groups discuss and debate the relative importance of different pupil needs and their implications for the school district's planning objectives.

Performance criteria or indicators

Just as there are many ways to think about objectives, one encounters many ways to assess performance. A generalized understanding of performance criteria, in this author's experience, results from the notion of "operational criteria." Although operational criteria are arbitrary and subjective, they explicitly state what will be observed, by whom, when, and under what conditions. Behavioral criteria, a sub-class of operational criteria, are designed for observing behavior and are most useful for assessing behavioral objectives. Assessment of performance for planning objectives may or may not necessitate direct behavioral observation.

This author partitions performance assessment into four steps:

1. The decision-maker must specify a performance criterion. A performance criterion specifies what will be observed to determine the extent to which a given objective has been met.
2. It is determined who will do the observing, when and under what conditions.
3. Possible performance outcomes are anticipated and their merit interpreted. Mathematically, we can say, an X-axis would display various

outcomes and a Y-axis would show the respective values as a percentage (0 - 100).

4. The final step involves making the observations and using the index to interpret the merit (or value) of the outcome that did result.

The basic idea underlying a performance indicator is that a knowledgeable decision-maker is able to specify, given some assistance and support, what information he would like to evaluate in order to determine the extent to which a given overall objective has been served. An interesting characteristic of a performance indicator, defined in the manner suggested, is that two children who receive the same item score (each get four correct out of a total of eight responses) may be credited with different performance index outcomes, depending on the assigned importance of that score to each individual child's progress.

Effectiveness

Concepts of effectiveness have been applied in various ways in planning. Usually the term is used as synonymous with good performance. A few authors indicate that effectiveness may be viewed as a function of two variables -- performance and the potential of the respective activities to contribute to the overall organization or system. An assessment of the ongoing system, as it is operating, can be made by considering effectiveness as a function of performance and worth. The requirements for such an evaluation are:

1. Each overall objective is assigned a weight in accord with its importance relative to the other overall objectives.
2. Each activity conducted under the auspices of the ongoing system is assigned a weight in accord with its relative importance or potential to contribute to its overall objective(s). This allows

the relative worth of each overall objective to be partitioned among its component activities.

3. A performance index, which will give a more or less formalized indication of the extent to which the activity has done what it could do, has been designed for each activity.

When activity performance is perfect (1.0, or 100% in other words, on the performance index) the full worth of the activity is realized and it is said to be totally effective. The effectiveness of an activity, in this context, is its performance index outcome weighted by its potential for contributing to the system. This implies that if two activities perform equally, the one with the higher potential value, from the point of view of a system-wide evaluation, is more effective.

Authors who give considerable attention to the synthesis of concepts dealing with objectives, values and performance are Fallon (p. 19), Chuang and Peper (p. 30), and Temkin (p. 31).

Most authors accept the notion that output of a system should in some sense be related to input so that alternatives can be evaluated. One family of such methods comes from the "input-output" methods of Wassily Leontief.* The shortcomings of such applications are that they avoid consideration of the process by which different sets of inputs relate to different outputs. In applications to education, process variables are generally mixed with input variables and those related to characteristics of the child and the home. But were the variables unconfounded there would still remain the problem of relating input-to-process-combinations to process-to-output-combinations.

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*W. W. Leontief, The Structure of American Economy, 1919-1939, New York, 1951, 2nd edition.

One of the most interesting methods belongs to Dyer (p. 43), who suggests a scheme that combines input-output search for hypotheses with experimental design considerations. Were it not for a scarcity of funds for education, Dyer's method could make a practical contribution to educational decision-making, since it would have the capability of taking educational processes into consideration.

Another way to bring input, process and output information together would be to develop a series of curves, one for each activity, that relate effectiveness to cost. This information would allow one to evaluate the amount of change in effectiveness for each change in cost for an ongoing activity. This could be plotted as a cost-effectiveness curve. Proposed alternatives could be introduced by developing a new curve and recognizing that new activities often have associated new fixed costs. Once the curves are drawn, then mathematical methods such as linear programming or a non-linear adaptation (see McNamara, p. 39 or Sisson's comments in Temkin's Appendix, p. 42) could be used to search for preferred alternatives.

Synthesis and implementation

PPBS-type methods were originally designed for research and development organizations. This planning mechanism was used to help select from among alternative ways to produce a given capability. The process generally began by defining a set of capabilities or "missions." This was followed by the development of alternative programs and budgets that could support the respective alternatives. Generally a multi-year plan resulted.

One of the major needs in managing a school system is a technique capable of relating outputs to costs. This need is dramatized by the

increasing demands on a small supply of educational dollars.

A PPBS is such an approach. The method, however, is more applicable to the planning of a completely new school system than to planning changes for an existing school system

A fundamental problem in applying PPBS to schools is that it does not lend itself to orderly transition from where a school district is to where management wants it to be. Orderly systemic change is a dynamic systems engineering problem that does not lend itself to a situation in which ends are merely specified and necessary changes are assumed to just happen automatically once this is done. People are responsible for conducting the affairs of schools. These people are individuals whose present behaviors are based on attitudes, values, beliefs, customs, training and experiences. Croston and Gregory (p. 60) indicate that the usual view of an organization, from within, supports a situation in which necessary information tends to flow upwards and downwards, but if planning information is to be related to organizational objectives a horizontal flow of information is needed. Helping people within the organization to understand and become comfortable with organizational objectives and horizontal communication flows is a necessary condition for comprehensive planning. Other necessary conditions are executive commitment (see Benton and Tenzer p. 59); widespread, meaningful involvement in planning and decision-making (see Eberle p. 61); sometimes, organizational restructuring in order to facilitate planning and change (see Andes and Kimbrough p. 51, and Maguire p. 54); and a good management system once intended changes are specified (see Cook p. 60).

The essence of a comprehensive planning process for schools, in the opinion of this writer, is to show teachers how to look at their work in the classroom so that they can evaluate what they do. In addition, roles are to be defined and clarified for principals, central office administrators and community groups. Effective and efficient change seldom comes about by means of changes in the accounting system or the budget alone.

In an ongoing, dynamic, and changing system the superintendent can detect changes in pupil achievements and changes in program budgets. But the simple fact remains that meaningful change can be best accomplished by developing and maintaining an educational process that is responsive to changing needs.

The above mentioned methods, techniques, and ideas can, and already have, contributed, in various measure and with varying results, to the problem of comprehensive system-wide planning in education. The following bibliography represents, hopefully, the vast emerging literature on the subject.

1.0 PLANNING PROCESS INFORMATION

1.1 Pupil-Needs

1) Campbell, Vincent N., and David G. Markle. "Identifying and Formulating Educational Problems." Berkley, Calif.: Far West Laboratory for Educational Research and Development, April, 1968.

"The aim of this project was to develop effective techniques for identifying educational needs and formulating them into well defined problems. The critical incident technique was used to identify need symptoms perceived by educators for a representative sample of schools throughout the region served by the Far West Laboratory. A hierarchy of categories was developed to describe these need data, which were then classified and tabulated by category. The problem formulation techniques explored informally included interview, observation, and small group discussion. We decided that knowledge of problem defining behavior is too primitive to justify step-by-step systemization of the process of formulation. The techniques we developed rather relied heavily on intuitive processes, and systematic control was aimed toward insuring that the product of the formulation contained the following elements: outcomes desired, values underlying outcomes, kinds of evidence for outcomes, present conditions, solution possibilities and immediate action alternatives. We experimentally compared three group problem defining techniques which differed on two dimensions: (a) whether or not the formulation was structured to obtain the elements listed above, and (b) whether or not the inquiry was directed by an experienced outside formulator. Eighteen three-person groups of educators were used in all. The problem definition produced by each group was evaluated independently by two other educators from the same district. Results favored the directed groups; among the undirected groups completely unstructured groups rated as high or higher than groups producing a structured definition. Implications for training and promising directions for further work on problem formulation systems are discussed." (Author)

2) McElhinney, James H., Richard C. Kunkel, and Lawrence A. Lucas. "Evidences of School Related Alienation in Elementary School Pupils." Paper presented at the American Educational Research Association, Minneapolis, March, 1970.

The students were given a 72 item questionnaire in which 11 items included responses that might suggest alienation. The authors provide an analysis of the results of each of the 11 items which shows that various degrees of alienation exist in every school included in the sample. Finally, the authors suggest implications of these findings to alleviate these problems.

3) Mirsky, Joseph. "Pupil-Event Analysis for Needs Assessment." Philadelphia: Research for Better Schools, December, 1969.

The author presents a brief argument for sampling "pupil-events" in order to learn about the nature of pupil-needs. He suggests that pupil-need assessments examine the functions of the school system as they relate to the things students do.

4) Popham, James W. "Educational Needs Assessment in the Cognitive, Affective, and Psychomotor Domain." A presentation at three ESEA Title III Regional Workshops sponsored by the U. S. Office of Education, Ft. Lauderdale, Fla., November, 1969; Philadelphia, Penna., December, 1969; Scottsdale, Ariz., December, 1969.

A first problem, identifying educational preferences, can be remedied by utilizing the behavioral objectives which are being developed by the Instructional Objectives Exchange of U.C.L.A. and then sampling the clientele to determine the priority of the objectives. A second problem, the identification of the learner's status, i.e., level of attainment can be solved by using criterion-referenced tests based upon the behavioral objectives. The third problem involves a contrast of preferences with status, i.e., a comparison of desired outcomes to current learner status, can be solved through the administration of criterion referenced tests.

(See also the annotation of Marvin Alkin's article, "Behavior Objective Specifications in Evaluation: Relevant or Irrelevant" which appears in section 1.4).

5) Rhea, Buford, et al. "Measures of Child Involvement and Alienation from the School Program." Chestnut Hill, Mass.: Boston College, 1966.

The purpose of this report is to assess the alienation and/or involvement of high school students through the use of short interviews supplemented by questionnaires. The sample consisted of two highly-rated, suburban Boston schools whose students were of middle to upper-middle class backgrounds. Although the authors concluded that students

did not display the traditional symptoms of alienation, they were not able to evaluate a disturbing anomaly which resulted in students converting intended educational goals into spurious means (good grades, admission to college, notion of "preparation"). They feel that more research should be conducted to evaluate how a "task-orientation" view of schools affects student alienation. Furthermore, the authors characterize a pattern that has developed in the two schools as "institutional paternalism." In the final sections of the report, the writers discuss some of the conceptual problems associated with measures of alienation and involvement.

6) Woodbury, Charles A., et al. "Research Model for State Educational Needs Assessment." Paper presented at the Annual Meeting of the American Educational Research Association, Minneapolis, March, 1970.

This paper summarizes the Virginia Needs Assessment Project's research strategy in determining learner-oriented needs in the cognitive, affective and psycho-motor domains. This approach requires the delineation of goals (four are mentioned), programmatic efforts (defined as implemented goals), and programmatic outcomes (measured by scores on standardized tests and scores on affective rating scales). Needs are represented as gaps that exist between the goals and the outcomes. Also included in the report are subordinate assessment strategies concerning the affective domain and goal perceptions.

1.2 Overall Objectives

1) A Plan for Evaluating the Quality of Educational Programs in Pennsylvania: Volumes I, II, and III. Princeton, N. J.: Educational Testing Service, June, 1965.

Initially, the report lists and discusses ten educational goals for Pennsylvania schools. Included is a proposed survey of public opinion to assess the relative importance of these goals. A methodology is outlined for the development of performance indicators which eventually would result in inter-school comparisons. These evaluations would point to needed educational policy adjustments for schools with comparable inputs and surrounding conditions.

Note: The measures designed as a result of this study have been used in Pennsylvania by the Department of Education in what has been referred to as "The Quality of Education Study."

This annotation also appears in section 1.4.

2) Downey, Lawrence W. "The Task of Public Education." Chicago: University of Chicago, Midwest Administration Center, April, 1960.

This detailed study was performed to determine the tasks of public education (elementary and high school) and the importance of these tasks (priorities) as seen by a representative sample of educators and non-educators. A conceptual framework outlining the tasks of public education was formulated from an historical overview and a synthesis of ideas. The study utilized the Q-sort technique of forced choice for determining goal priorities of schools.

3) Educational Goals and Objectives in California. Sacremento, Calif.: California School Boards Association, August, 1969.

This report consists of the goals and objectives formulated by 900 school districts of California in conjunction with the California School Boards Association. Distinctions among philosophies, goals, and objectives are described, and 18 general goal categories have been generated. Also, 51 entries appear in a bibliography on goals and objectives.

This annotation also appears in section 5.0.

4) Goals for Public Education in Texas. A Report by the Subcommittee on Goals to the Governor's Committee on Public School Education, U. S. Office of Education. Texas: Operation PEP, December, 1968.

This report traces the historical evolution of educational goals. It is intended as an aid to those educational planners and managers who must translate educational objectives into operational terms. A bibliography of consulted references is attached to the study as well as appendixes which contain goal statements from quoted sources.

This annotation also appears in section 5.0.

5) Instructional Goals. Radnor, Penna.: Radnor Schools, February, 1970.

The goals developed in this paper are modeled after the goals generated by the Educational Testing Service for the Pennsylvania State Board of Education. The goals are oriented to specific programs within these content categories of communications, liberal arts, and personal development. A fourth goal, organization, involves strategies designed to present content goals most effectively.

1.3 Assignment of Weights to Objectives and Outcomes

1) Ackoff, Russell L. "Towards Quantitative Evaluation of Urban Services," Public Expenditure Decisions in the Urban Community, (Washington: Resources for the Future, Inc., 1962).

Ackoff proposes a method for evaluating community values associated with a collective good or service. He lists six requirements or attributes of an ideal measure of performance for determining social utility. In addition, he applies his evaluative technique to conceptual problems in transportation and education. In the latter regard, Ackoff sees education as an accelerator of societal progression and as a decelerator of regression, and he develops a theoretical model for the evaluation of education based upon this progression-regression principle.

2) Alesch, D. J. Improving Decision Making About Priorities in State Government. Clearinghouse for Federal Scientific and Technical Information Contract #AD693648. Santa Monica, Calif.: Rand Corporation, September, 1969.

The author proposes a means of priority-setting which necessitates changes in the institutional framework of state government. Alesch stresses the need for a procedure, which he refers to as the problem-opportunity approach, that cuts across traditional groupings of public agencies. He lists and describes four criteria for determining problem priorities. Moreover, he enumerates four requirements for moving towards a system of priority-setting: a synthesis of planning and budgeting functions, the creation of needed information systems, the need for participatory priority-setting, and the necessity of a flexible system.

3) Anderson, Donald P. "Clarifying and Setting Objectives on an Intermediate School District's Objectives Utilizing the Delphi Technique." Paper presented at the Annual Meeting of the American Educational Research Association Symposium on Exploring the Potential of the Delphi Techniques by Analyzing its Applications, March, 1970.

One of the most important, but often neglected, processes in any organization is that of explicating and setting priorities on objectives or target conditions. The situation is confounded in service systems such as intermediate school organizations. Consensus on such priorities is rarely achieved or even attempted. The Delphi Technique, built on the strength of informed intuitive judgement and designed to produce consensus, provides a procedure to alleviate this problem situation.

Experts, identified from inside and outside a County School District, generated an initial statement of objectives by completing a stem sentence related to long-range resource allocation. The statements clustered into two sets: client services and organizational adaptations. Using three Delphi questionnaires, priorities were assigned to each set independently using "zero sum" logic. The client service objectives are being used currently in program planning efforts; the organizational adaptation set was used to modify the County Office organization.

4) Baumol, William J. "Neumann-Morgenstern Cardinal Utility," Economic Theory and Operations Analysis, (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1961), pp. 331-346.

In Chapter 17 the author presents a classic method, emerging from economic cardinal utility analysis, of assigning utility or worth to predictable outcomes. Baumol mentions that a calculation based on the utilities of alternative outcomes, rather than the magnitudes of outcomes, may be more useful to decision-makers.

5) Churchman, C. West, Russell L. Ackoff, and E. Leonard Arnoff, "Weighting Objectives," Introduction to Operations Research, (New York: John Wiley & Sons, Inc., 1957), pp. 136-154.

In Chapter 7, a method is presented for estimating the relative value of objectives. Initially, the authors assume that judgments are made by one evaluator, but this precondition is relaxed in a later discussion of group values. Their technique consists of a "systematic check on relative judgments by a process of successive comparisons." An easy-to-follow outline both for a small and a large number of objectives is provided along with two illustrative examples for further understanding.

6) Dalkey, N. "Analyses From a Group Opinion Study," Futures, I (December, 1969), pp. 541-551.

The author conducted various experiments in the use of a Delphi questionnaire. He experimented with the idea that point estimates were less accurate than interval estimates. He tested various hypotheses including learning as a function of feedback, time as related to the accuracy of responses, and overall accuracy as a function of confident self-groups.

Furthermore, the author concludes that even though the Delphi method has dealt only with factual judgments, it may be applicable to the weighting of value judgments (organization objectives). If value judgments are indeed "correct," then there is the need for tests of individual stability, group convergence and group reliability.

7) Downey, Lawrence W. "The Task of Public Education." Chicago: University of Chicago, Midwest Administration Center, April, 1960.

The purpose of this study was to determine the tasks of public education (elementary and high school) and the importance of these tasks (priorities) as seen by a representative sample of educators and non-educators. A conceptual framework outlining the tasks of public education was formulated from an historical overview and a synthesis of ideas. The study utilized the Q-sort technique of forced choice for determining goal priorities of schools.

Findings are presented in detail.

This annotation also appears in section 1.2.

8) Fallon, Carlos. "Practical Use of Decision Theory in Value Engineering," Journal of Value Engineering, II (May, 1954), pp. 45-49.

Fallon provides a brief history of value theory from Daniel Bernoulli to von Neumann and Morgenstern, Savage, Raiffa and Schlaiffer.

Of particular interest is a "selection matrix" which combines an assignment of importance with an estimate of effectiveness to arrive at the "value of the i-th course of action."

In order to maintain the integrity of Fallon's contribution a crucial paragraph is cited:

> "It should be noted that we do not use the word effectiveness to denote weighted efficiency, as is sometimes done in a game-theoretic context. For our purpose, we must accept the word efficiency in the ordinary sense of productivity without waste, as measured by a comparison of production with cost, and we must use effectiveness also in its ordinary sense of producing a desired effect (independent of the cost of producing such effect)." (Author)

9) Fishburn, Peter C. "Utility Theory," Management Science, XIV (January, 1968), pp. 335-378.

"Utility theory is interested in people's preferences or values and with assumptions about a person's preferences that enable them to be represented in numerically useful ways. The first two sections of this paper say more about what utility is, why people are interested in it, and how it is interpreted and used in the management and behavioral sciences. The third section summarizes a number of utility theories: it may be used either as a concluding overview of the range and variety of utility theories or as a bridge

to the final sections. The final eight sections comprise a semi-technical survey of particular theories for readers interested in greater depth." (Author)

(See also citation in section 5.0).

10) Grayson, Jackson C. Decisions Under Uncertainty: Drilling Decisions by Oil and Gas Operators. Boston: Harvard Business School, 1960.

Grayson's study of decision-making in the oil drilling industry is a classic if only for its clear presentation. This analysis of decisions, using Bayesian statistics, is one of the first applied efforts found in the literature. In addition, Grayson does some of the first experimental empirical work on individual utility functions.

11) Helmer, Olaf. "Convergence of Expert Consensus Through Feedback." Santa Monica, Calif.: Rand Corporation, September, 1964.

This is one of the earliest reports in the literature of an application of the Delphi Method. An effort is made to explore some assumptions implicit in the use of this method.

12) Huber, George P., Vinod K. Sahney, and David L. Ford. "A Study of Subjective Evaluation Models," Behavioral Science, XIV (1969), pp. 483-489.

"The research reported explores some questions which arise when staff groups, such as operations research groups, are faced with obtaining a quantitative representation of an individual's or an organization's evaluation scheme. The study is concerned with the ability of professional hospital personnel to develop and use a subjective evaluation model in a reliable manner, the possible forms of such a model, and the extent to which the models used by the professionals reflected some recognizable organizational evaluation scheme." (Author)

13) Klahr, David. "Decision Making in a Complex Environment: The Use of Similarity Judgments to Predict Preferences," Management Science, XV (July, 1969), pp. 595-618.

"Judgments of the relative similarity of pairs of alternatives are used to construct a model of the decision space of a group of college admissions officers. This model is then used to predict the preferences of the officers. The accuracy of the predictions

supports the hypothesis that preference judgments are made on the basis of the similarity of given alternatives to an "ideal" alternative. A nonmetric multidimensional scaling procedure is used to construct the space. This procedure yields a dimensional representation based upon very few assumptions about the nature of the similarity measures." (Author)

14) Peper, John B. "Summary of Program Relevance Evaluation Model." An address prepared for the American Educational Research Association, Minneapolis, March, 1970.

This paper may be viewed as a companion to the paper by Ying Chuang and Peper. (See section 2.1) The major purpose of Peper's paper is to report the development and use of the model in Philadelphia rather than a detailed description of the model itself. The discussion treats the assignment of priorities in the form of relative weights to projects. Peper concludes that the model appears to be useful in program planning and in making new funding decisions.

This annotation also appears in section 2.4.

15) Reisman, Arnold, and Martin I. Taft. "A Systems Approach to the Evaluation and Budgeting of Educational Programs," Socio-Economic Planning Sciences, III (1969), pp. 245-277.

This item refers specifically to pages 247-251, whose explicit purpose is to develop a composite utility function for learning effectiveness so that resources can be allocated in order to maximize that function. The authors enumerate and discuss their utility criterion. They develop a theoretical approach which measures the relative utility of competing departments in relation to total utility, given an environment.

16) Rescher, Nicholas. "Delphi and Values." Santa Monica, Calif.: Rand Corporation, September, 1969.

The author's primary aim is to provide a discussion of theoretical background considerations for the application of the Delphi method. Seven aspects are considered on pages 16 and 17. Among these are operative values, value criteriology, divergences of group value posture, value consensus, and third party evaluation of conflicts of interest.

17) Rothenberg, Jerome. The Measurement of Social Welfare. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1961.

Rothenberg surveys, in depth, a substantial portion of welfare economics theory. This book treats many topics among which are sections on preferences, utilities, and social welfare functions.

18) Schimpeler, Charles C., and William L. Grecco. "Systems Evaluation: An Approach on Community Structure and Values," Highway Research Record, CCXXXVIII (1968).

In the early sections of their report, the authors summarize various efforts in systems evaluation. Their analytical method of plan evaluation has three stages. First, in a Louisville study, the authors describe their technique for obtaining a set of weighted objectives. Second, they present their evaluation model which consists of an effectiveness matrix and a utility-based decision model. Third, they introduce a modification which takes into account the effects of socioeconomic strata in the community.

19) Stimson, David H. "Utility Measurement in Public Health Decision Making," Management Science, XVI (October, 1969), pp. B-17-B-30.

"The Churchman-Ackoff approximate measure of value method was used successfully to measure the utilities of objectives of decision makers in a large public health agency. The utilities thus obtained formed part of a model of a resource allocation problem faced by the agency in its role as allocator of a federal grant. A comparison of the normative solution derived from the model with the solution already decided upon by the agency tended to support the hypothesis that the members of the agency chose among alternatives as if they were maximizing expected utility." (Author)

(See Churchman, Ackoff and Arnoff citation in section 1.3. See also citation in section 5.0.)

20) Torgerson, Warren S. Theory and Methods of Scaling. New York: John Wiley & Sons, Inc., 1958.

This is a reasonably up-to-date book about scaling theory. One may draw two conclusions: scaling-theory and methods are cumbersome, and scaling-theory and methods have little to contribute to the solution of problems of assigning weights to outcomes by single and group decision-makers.

21) Winkler, Robert L. "The Quantification of Judgment: Some Methodological Suggestions," Journal of the American Statistical Association, LXII (December, 1967), pp. 1105-1120.

"The personalistic theory of probability prescribes that a person should use personal probability assessments in decision-making and that these assessments should correspond with his judgments. Since the judgments exist solely in the assessor's mind, there is no way to prove whether or not this requirement is satisfied. De Finetti has proposed the development of methods which should oblige the assessor to make his assessments correspond with his judgments. An ideal assessor is hypothesized and his behavior is investigated under a number of such methods (including those suggested by de Finetti and others). The implications of these methods for the theory of personal probability are discussed. Finally, although the present interest is primarily normative, the practicability of the methods is also discussed." (Author)

Winkler's analysis pertaining to aspects of subjective or personal probabilities seems to have a great deal of relevance and carry-over to the assignment of subjective ratings. A brief bibliography at the end of this article is crammed with references to theory on subjective probabilities and Bayesian statistical analysis.

1.4 Performance Criteria

1) Alkin, Marvin C. "Behavior Objective Specifications in Evaluation: Relevant or Irrelevant?" Western Regional Conference on Testing Problems, (Princeton, N. J.: Educational Testing Service, May, 1969), pp. 1-13.

The purpose of this paper is to determine when behavioral objectives are helpful in the process of evaluation. The author defines evaluation and lists its five stages: systems assessment (determination of needs and objectives), planning (selection of a program), program implementation (assessment of actual versus intended effects), program improvement (presentation of interim feedback to the decision-maker), and program certification (presentation of final feedback to the decision-maker). Behavioral objectives are useful in the first, fourth and fifth stages. Although there is little evidence to suggest that decisions are affected by the presentation of behavioral objectives, Alkin has established an Instructional Objectives Exchange at UCLA to provide local decision-makers with behavioral objectives and test items.

2) A Plan for Evaluating the Quality of Educational Programs in Pennsylvania: Volumes I, II, and III. Princeton, N. J.: Educational Testing Service, June, 1965.

Initially, the report lists and discusses ten educational goals for Pennsylvania schools. Included is a proposed survey of public opinion to assess the relative importance of these goals. A methodology is outlined for the development of performance indicators which eventually would result in inter-school comparisons. These evaluations would point to needed educational policy adjustments for schools with comparable inputs and surrounding conditions.

Note: The measures designed as a result of this study have been used in Pennsylvania by the Department of Education in what has been referred to as "The Quality of Education Study."

This annotation also appears in section 1.2.

3) Brink, Charles B. Social Change Evaluation Project Final Report Volume I. Clearinghouse for Federal Scientific and Technical Information Contract #184522, Washington D. C.: Washington University, June, 1968.

Pages 80-83 are devoted to the question of effectiveness. The author lists three possible ways to measure effectiveness: measurement of the impact in terms of organizational objectives, measure the difference as a consequence of the program instituted, and, establishment of a set of exploratory probes to measure selected points of impact. The authors describe a number of difficulties in using either the first or second approaches. Characteristics and examples of exploratory probes are discussed.

4) Dyer, Henry S. "The Concept and Utility of Educational Performance Indicators." Paper presented at the Systems Science and Cybernetics Conference, Boston, October, 1967.

The author describes a technique for the development of educational performance indicators based upon regression analysis. A theoretical model is presented to the reader with suggestions and interpretations of its use. Possible problems of implementation are discussed. Finally, Dyer implies that educational performance indicators may "provide a basis for genuine cost-benefit analysis."

This annotation also appears in section 2.5.

5) Eiss, Albert F., and Mary Blatt Harbeck. Behavioral Objectives in the Affective Domain. Washington, D. C.: National Science Supervisors Association, 1969.

The primary aim of this monograph is to present a methodology for developing behavioral objectives in the affective domain of science in order to create "scientific literacy" in students. The report focuses on the difficulty of assessing whether or not an overt student behavior is indicative of the desired objective. This slippage (which the authors refer to as the "credibility gap") is especially apparent in the affective domain. Therefore, the authors suggest the use of "open-loop" behavioral objectives, rather than the "closed-loop" types which are limited to the cognitive area. In addition, the appendices provide examples of affective behavioral objectives, evaluation items in the affective domain, and evaluation instruments suitable to this area.

6) Friedly, Philip H., et al. "Benefit-Cost Applications in Urban Renewal: A Feasibility Study." Clearinghouse for Federal Scientific and Technical Information Contract #182969, Bethesda, Md.: Resource Management Corporation, August, 1968.

This item refers to Chapter 6, of this report, "Evaluating the Impacts of Renewal Activities." A matrix is developed showing the interactions between 11 urban renewal objectives and 11 welfare indicators. Measuring these 11 welfare indicators would yield information regarding the attainment of the specified objectives. Nevertheless, in their discussion of each of the welfare indicators, the authors point out that the criteria are not necessarily commensurable. Empirical testing must now provide information about usefulness and administrative costs for the respective indicators.

This annotation also appears in section 3.1.

7) Hatry, Harry P. Criteria for Evaluation in Planning State and Local Programs. A Study Submitted by the Subcommittee on Intergovernmental Relations to the Committee on Government Operations. Washington, D. C.: George Washington University, July, 1967.

This paper identifies specific criteria for use in evaluating alternative plan proposals in seven major program areas within a PPBS format. This work is particularly adaptable to state and local government functions. The author describes the properties of ideal criteria and, moreover, he lists and discusses 17 other considerations and attributes of his criteria. Most of those enumerated are nonmonetary criteria. In addition, Hatry indicates where his performance measures may be deficient and also where they may overlap into other program categories. For the reader's reference, a PPBS government program structure is illustrated in the appendix.

8) Kurland, Norman D. "Developing Indicators of Educational Performance," Educational Technology, VII (1967).

The author identifies some of the fundamental aspects of educational performance indicators. First, he lists some reasons why educational performance has been difficult to assess, then he proceeds to specify the attributes of good performance measures. In addition, he delves into the problems of data collection, input factor measurement, process factor quantification, and output factor adequacy. In the latter regard, he gives special mention to Ralph Tyler's national assessment project. Finally, he suggests that an adaptation of econometric models may have some applicability towards developing educational performance indicators.

9) McDevitt, Matthew, and Thomson McGowan. "New York State's Central Social Environment Study." Albany, N. Y.: New York State Office of Planning Coordination, January, 1970.

"This monograph describes the background and current status of a Central Social Environment Study which the New York State Office of Planning Coordination is designing. The report describes the need for such a monitoring system to provide the state's decision makers with continuous information on social attitudes and problems and to evaluate systematically the state programs which deal with these problems, and steps being taken to meet this need." (Author)

10) Miller, James R. Assessing Alternative Transportation Systems. Clearinghouse for Federal Scientific and Technical Information Contract #185167. Santa Monica, Calif.: Rand Corporation, April, 1969.

This item is specifically concerned with sections of the report dealing with the concept and measure of "worth". Miller defines the "worth" of an alternative as its ability to accomplish a given objective. Worth does not require a consensus among decision-makers nor does it specify temporal stability. The author describes the essential features of his scale of worth. For example, his scale ranges from +1 to -1 where positive values imply positive worth points (gratiles), negative values suggest negative gratification points and "0" represents a point of indifference. Assigned worth numbers are assumed to occur with complete certainty, therefore a risk factor is not included in Miller's formulation. (It should be pointed out that Miller's concept of "worth" is consistent with concepts of "performance").

11) Mood, Alex M. "Macro-Analysis of the American Educational System," Operations Research, XVII (September-October, 1969), pp. 770-784.

"This paper presents a rudimentary model of the public school system as an input-output process. The inputs are students' own abilities and attitudes, parental support, peer support, quality of the school system, community support, and society's posture with respect to education. Outputs are various categories of academic achievement as well as social competence, responsibility, self confidence, creativeness, ethics, and ambition. All these factors must be measured by index numbers or simple indicators. The model is a set of regression equations relating outputs to inputs. Some implementation of the model has been made possible by means of data gathered in the U.S. Office of Education's Equality-of-Educational-Opportunity Survey." (Author)

This annotation also appears in section 2.5.

12) Richard, Robert. Subjective Social Indicators. Clearinghouse for Federal Scientific and Technical Information Contract #PB187944. Chicago: National Opinion Research Center, September, 1969.

The purpose of this report is to describe the development of a "social profile of target areas." The author suggests that this report could be useful to program planners in locally sponsored surveys. The report covers the following topics: a review of the literature on social indicators and program planning and evaluation research, the research methodology employed, a discussion of survey measurement and question design, a listing of the set of items that encompass the social profile, and the development and rationale for some of the items used.

(See also citation in section 5.0).

13) Sisson, Roger L., and Edwin C. Brewin. "An Introduction to the Education-Planning-Programming-Budgeting System." Philadelphia: Government Studies Center of the Fels Institute, University of Pennsylania, November, 1969.

Sisson describes EPPBS (the "E" stands for education) as a method which helps the school district determine its present situation and project various ways in which the school district could operate in the future. An EPPBS planning methodology is presented. An essential element of EPPBS is the indicator. Indicators are developed for both inputs and outputs under conditions of no overall policy changes (baseline projection) and under policy adjustment (the selection of a plan). They also show gaps between present operations and future requirements. These gaps become objectives

from which projects are generated to close indicator gaps. In sum, EPPBS permits the decision-maker to see the possible consequences of "plans of operation in terms of both indicators (which show benefits and effects derived) and financial factors (which measure the costs)."

This annotation also appears in section 2.2.

14) Webb, Eugene J., et al. Unobtrusive Measures: Nonreactive Research in the Social Sciences. Chicago: Rand McNally & Company, 1966.

The main concern of the authors lies in an over-reliance on the interview and questionnaire as means of data collection. They favor a multiple measurement scheme which would utilize complementary techniques to test hypotheses and to broaden the perception of social scientists. First, the authors explain some of the limitations of traditional methods mentioned. Then they discuss and report studies that have used supplementary, unobtrusive measures. Most of these methods are free from the essential bias of the interview and questionnaire -- the respondent's reactive effects. Some of the methods recommended include the use of physical traces, archives and simple observation. The authors describe the advantages as well as the pitfalls associated with each technique.

1.5 Cost and Accounting Problems

1) A Study Design for a Comprehensive Planning Program in the Denver Region. Clearinghouse for Federal Scientific and Technical Information Contract #6808. Denver: Denver Regional Council of Governments, December, 1968.

The fourth chapter of the Denver Regional Council of Governments comprehensive plan discusses the development of a system for managing the studies that are to be used as inputs to the overall planning process. Included are descriptions of manpower and cost requirements, programming and scheduling of activities, implications with respect to organization and the development of a management information system.

This annotation also appears in section 3.2.

2) Kelly, James A. "Budget Decision Making in Large Public School Systems," Socio-Economic Planning Sciences, II (1969), pp. 135-140.

"This paper reviews and discusses results of a study of the budget process in fourteen large city school districts. Topics covered include incremental decision making, the use of "ratios" and "norms" in school budgeting, public participation in budgeting, relevant structural arrangements of local government, and the influence of boards of education on the allocation of resources. Finally, implications for the improvement of school management practices in large school districts are discussed." (Author)

3) King, Barry G. "Cost-Effectiveness Analysis: Implications for Accountants," Journal of Accountancy, CXXIX (March, 1970), pp. 43-49.

This article suggests that accountants should become more aware of the uses and limitations of cost-effectiveness analysis. Accountants should take a more comprehensive view of organizational objectives and costs. The author feels that part of the accounting function is to assist management in the search for measures of effectiveness.

4) Temkin, Sanford. "Cost-Effectiveness Evaluation as an Input into the Budgetary Process." Philadelphia: Research for Better Schools, Inc., June, 1969.

The author presents a four-year plan suggesting how a school district could make a transition from a line item budget to one which reflects school objectives and activities. The key to implementing such a system, the author points out, is to allow more people in the school system to participate in the planning process.

5) Tenzer, A. J., J. B. Benton, and C. Teng. "Applying the Concepts of Program Budgeting to the New York City Police Department." Santa Monica, Calif.: Rand Corporation, June, 1969.

This memorandum describes, in a very pragmatic manner, three phases of the PPB System developed for the New York City Police Department: the stages of developing a program-budgeting format for five essential programs, a cost-estimating methodology for two major cost categories, and an on-line computer model for estimating cost implications of alternative resource allocations.

This annotation also appears in section 2.2.

2.0 SYSTEM WIDE PLANNING METHODS

2.1 Comprehensive Planning

1) Chuang, Ying C., and John B. Peper. "The Philadelphia Model for Title I Evaluation." Philadelphia: School District of Philadelphia, April, 1969.

The authors describe the development of an evaluation model for Title I projects in the Philadelphia School System. The evaluation model has two major divisions: an individual project evaluation model, and an overall cost-effectiveness model. The latter was formulated so that meaningful comparisons could be made among projects. The authors present a theoretical discussion of the evaluation model.

This annotation also appears in section 2.4.

2) Magoon, Jon, and Francis Tannian. "School System Analysis: An Interaction Process Model." Newark, Del.: University of Delaware, March, 1970.

"The model outlined here describes sociological, political, economic, and educational interactions in an urban school system in order to describe how the system is performing and might be amenable to change and reform." The authors describe their model as a multi-stage input/output scheme which draws some of its technique from Jesse Burkhead's input/output model for city school systems. Six variables have been chosen for study: pupil achievement, the community, the bureaucracy, the political elites, the teacher, and economic resource allocation. Ultimately, the information gathered will have practical utility for the school program decision-maker.

3) Sandberg, John (ed.). Schools and Comprehensive Urban Planning. Portland, Oreg.: Northwest Regional Educational Laboratory, September, 1969.

The purpose of this document is to suggest ideas that will help school administrators work more effectively with local, state and regional planning bodies. The authors stress the urgency for comprehensive, interagency planning in urban areas. A series of articles examines some aspects of integrative, cooperative planning. For example, John Sandberg's article assesses some of the problems that beset agencies that try integrative planning. In an article entitled, "Urban Planning Objectives," the authors list certain

"do's and don'ts" for involving citizens in the planning process. They also state that the quality of public participation depends largely on the peoples' access to facts and ideas. The latter two articles by Hansen and Musolf discuss planning models (types of models and strategies used to bring about change) and the stages in the development of an information system for urban areas.

This annotation also appears in sections 3.2 and 4.1.

4) Temkin, Sanford. "Comprehensive Planning for School Districts." Paper prepared for American Educational Research Association Symposium, Minneapolis, March, 1970.

The author feels that current "PPBS approaches" present serious implementation problems for school districts. He provides a methodology for engaging in comprehensive, system-wide planning for school districts. The author contends that an evolutionary installation of the planning mechanism is required because the planning mechanism itself causes a great deal of change. Once the planning mechanism has been installed information flows can be generated to evaluate the system as it is, in order to form a basis for future change decisions.

This annotation also appears in section 4.2.

5) Temkin, Sanford. "A Comprehensive Theory of Cost-Effectiveness." Philadelphia: Research for Better Schools, Inc., April, 1970.

The author notes two deficiencies that stem from contemporary cost-effectiveness methods. Each technique suffers from a lack of a firm theoretical base of assumptions, and an absence of a means for selecting an efficiency technique for a practical problem. This paper is intended to correct these inadequacies and to appeal to the mathematically-trained person who is interested in a general theory of school system planning and in methods such as cost/benefit and cost-effectiveness analysis. Temkin presents a theoretical development of 9 decision cases in an evolutionary framework ranging from the simplest decision-making situation (Case 1) to complex circumstances faced by school administrators (Cases 8 and 9). The cases are augmented by mathematical proofs. In addition, the author discusses his rationale for recommending the use of cost-effectiveness for school district comprehensive planning rather than benefit/cost analysis.

This annotation also appears in section 2.4.

2.2 PPBS

1) Judy, Richard W. "Systems Analysis for Efficient Resource Allocation in Higher Education." Canada: University of Toronto, Institute for the Quantitative Analysis of Social and Economic Policy, January, 1970.

This article describes the major projects of the Research Program on Systems Analysis for Efficient Resource Allocation in Higher Education and indicates their status at the end of 1969. Mention is made of the PPBS project and its major tasks, a schematic is included of CAMPUS, a simulation model, and attention is devoted to the objectives and status of integrated university information systems. Space is also given to project facilities and university information resource centers.

(See also citation in section 5.0).

2) McAbee, Harold V. "Planning-Programming-Budgeting Systems and State Educational Agency Administration." Washington, D. C.: United States Office of Education Department of Health, Education, and Welfare, February, 1969.

This item refers to a position paper prepared for The United States Office of Education Department of Health, Education, and Welfare by Harold V. McAbee of the Teaching Research Division of the Oregon State System of Higher Education. The report is divided into three sections. Primarily, a summary of the attributes and design of PPBS with implications for application to state education agencies is contained in Parts I and II. Part III is devoted to two plans, one for the U. S. Office of Education and the other for state school officers, in order to field test, revise and implement a PPB System.

3) McAbee, Harold V. The Oregon Planning Programming Budgeting Systems Institute. Monmouth, Oreg.: Teaching Research Division, Oregon State System of Higher Education, December, 1968.

A report of an Institute [August 19-30, 1968] designed to acquaint state level, vocational education administrators to the potential and structure of Planning, Programming, Budgeting Systems, a program/Systems approach to budgeting. A variety of curriculum materials were collected and developed. The report includes substantial content about PPBS. The need and potential for a new approach to budgeting are outlined as well as areas for further research, development, and application. Briefs of all Institute presentations and other activities are included along with extensive bibliographical references, Institute program, participants, and evaluation. Basic economic principles which undergird PPBS are explained. Applications of cost/benefit and cost-effectiveness analysis are detailed. (ERIC Report Resume)

(See also citation in section 5.0).

4) McGivney, Joseph H., and William C. Nelson. Program, Planning, Budgeting Systems for Educators. Volumes I, II, III: An Annotated Bibliography. Columbus, Ohio: Ohio State University, December, 1969. ERIC# ED 032417 (Vol. I), ERIC# ED 032418 (Vol. II), ERIC# ED 035756 (Vol. III).

"Planning, Programming, Budgeting System (PPBS) includes concepts and techniques for resource allocation decision making for rational and effective programming. Most federal agencies use PPBS for the development, analysis and presentation of resource needs. Traditional methods of budgeting focus primarily on resource inputs. PPBS focuses on both inputs (cost) and outputs (benefits). The guidelines in this volume suggest initial training in a sequential pattern for a course in PPBS. Examples used are drawn from the field of vocational education. Included in the instructional outline are sections relating to: (1) Overview, (2) Systems Theory, (3) The Planning Process, (4) Investment Alternatives, (5) Program Budgeting, (6) Analysis of Alternatives, (7) Programming and Management Control, (8) Basic Data for PPBS, and (9) Limitations of PPBS. The document contains three parts: The What-When-Where-Who-Why of This Educational Program, An Educational Training Program in PPBS, and a Supplement to the Basic Educational Program. The supplements include pre- and post - tests, a conceptual framework, the relationship of education and economics, and methods of statistical analysis in PPBS. Volume II presents a simulated case problem based upon the PPBS concepts and principles developed in Volume I." (Author)

(See also citation in section 5.0).

5) Mushkin, Selma J., and James R. Cleaveland. "Planning for Educational Development in a Planning, Programming, Budgeting System," Interdependence in School Finance: The City-The State-The Nation (Washington, D. C.: National Education Association, March-April, 1968), pp. 59-99.

This paper is directed to school administrators in order to clarify PPBS terms and concepts. Also included in this report is a schematic framework that has been developed for the purpose of making more informed policy choices for education. This framework shows how broader purposes of government can be classified into a hierarchy of objectives and suitable program structures. In addition, stages of analysis, explanation of program costs,and measures of effectiveness are presented. Furthermore, an illustrative program structure and output indicators are detailed.

(See also section 2.4 for the annotation of Planning for Educational Development in a Planning, Programming, Budgeting System. Washington, D. C.: National Education Association, 1968, pp. 39-46.)

6) Piele, Philip K., and David G. Bunting. Program Budgeting for the School Administrator: A Review of Dissertations and Annotated Bibliography. Eugene, Oreg.: ERIC Clearinghouse on Educational Administration, September, 1969.

In this booklet, the authors have synthesized many significant ideas of program budgeting which have arisen from doctoral dissertations. Their purpose is to disseminate this information to school administrators who are considering the possibility of adopting a program budget. Finally, the authors provide an annotated bibliography of the dissertations used in their presentation.

This annotation also appears in section 5.0.

7) Sisson, Roger L., and Edwin C. Brewin. "An Introduction to the Education-Planning-Programming-Budgeting System." Philadelphia: Government Studies Center of the Fels Institute, University of Pennsylvania, November, 1969.

Sisson describes EPPBS (the "E" stands for education) as a method which helps the school district determine its present situation and project various ways in which the school district could operate in the future. An EPPBS planning methodology is presented. An essential element of EPPBS is the indicator. Indicators are developed for both inputs and outputs under conditions of no overall policy changes (baseline projection) and under policy adjustment (the selection of a plan). Indicators show gaps between present operations and future requirements. These gaps become objectives from which projects are generated to close indicator gaps. In sum, EPPBS permits the decision-maker to see the possible consequences of "plans of operation in terms of both indicators (which show benefits and effects derived) and financial factors (which measure the costs)."

This annotation also appears in section 1.4.

8) Tenzer, A. J., J. B. Benton, and C. Teng. "Applying the Concepts of Program Budgeting to the New York City Police Department." Santa Monica, Calif.: Rand Corporation, June, 1969.

This memorandum describes, in a very pragmatic manner, three phases of the PPB System developed for the New York City Police Department: the stages of developing a program-budgeting format for five essential programs, a cost-estimating methodology for two major cost categories, and on-line computer model for estimating cost implications of alternative resource allocations.

This annotation also appears in section 1.5.

9) Wildavsky, Aaron. "The Political Economy of Efficiency," The Public Interest (Summer, 1967), pp. 30-48.

Wildavsky proposes a policy analysis technique as an alternative to PPBS. He analyzes and compares experiences of the Defense Department and domestic agencies with PPBS. He concludes that PPBS has been damaging to prospects for improved policy analysis at the federal level. Finally, he suggests ways to facilitate better policy analysis.

This annotation also appears in section 4.1.

2.3 General Systems and/or Economic Analysis

1) A Study Design Prospectus for Georgia Comprehensive Statewide Transportation Planning. Prepared for the State of Georgia State Planning Bureau Contract #PB182703. Washington, D. C.: Harold F. Wise & Associates, McLean, Va.: Alan M. Voorhees & Associates, December, 1968.

This technically-oriented prospectus is divided into two chapters. The first chapter describes an approach to comprehensive statewide transportation planning. The second chapter discusses a proposed method for designing the study, including a suggested organizational framework, as well as discussing costs that are involved in the study design.

2) Dror, Yehezkel. "Systems Analysis for Development Decisions: Applicability, Feasibility, Effectiveness and Efficiency." Santa Monica, Calif.: Rand Corporation, August, 1969.

Dror suggests that systems analysis is not adaptable to all levels of problems. He proposes a meta-analysis (an analysis of the cases where system analysis is most effective). He presents a schema showing the degrees of applicability or feasibility in using system analysis in eight problem areas, one of which is education. In general, he concludes that system analysis is more useful for low or medium-level decision-making or in suboptimizing cases of higher-level problems.

This annotation also appears in section 3.1.

3) Enthoven, Alain, C. The Simple Mathematics of Maximization, Santa Monica, Calif.: Rand Corporation, November, 1959.

This report presents a thorough, clear mathematical discussion of maximization for public sector analysis.

4) Forrester, Jay W. "A Deeper Knowledge of Social Systems," Ekistics, XXVIII (April, 1969), pp. 360-367.

The author suggests that complex social systems can be viewed through the use of two variables (levels and rates) and the resulting feedback generated. Furthermore, he states that computer-oriented models, based upon level and rate schematics, should be used to replace unreliable, intuitive judgments. He describes the development and use of a complex, urban simulation model. In addition, Forrester includes policy changes into the model and concludes that many present day policies may be detrimental to a city.

This annotation also appears in section 3.3.

5) Hill, Morris. "A Goals-Achievement Matrix for Evaluating Alternative Plans," AIP Journal, XXXIV (January, 1968), pp. 19-29.

This paper examines the efficacy of some established techniques of plan evaluation by cost/benefit analysis. The presentation focuses on water resource development projects and applications of "balance sheet of development" to urban planning. It is demonstrated that these techniques do not fully satisfy the requirements of a rational planning process. An alternative method of plan evaluation, known as the goals-achievement matrix, is postulated and considered in terms of requirements of a rational planning process.

6) Brandl, John E. "Comment on the Goals-Achievement Matrix for Evaluating Alternative Plans," AIP Journal, XXXIV (March, 1969), pp. 139-140.

This article is a rebuttal to Morris Hill's article "A Goals-Achievement Matrix for Evaluating Alternative Plans," Journal of the American Institute of Planners, XXXIV, No. 1 (January, 1968), pp. 19-29. Brandl suggests that Hill's goals-achievement matrix has three deficiencies: it fails to regard diminishing marginal utility and this omission limits the approach to linear objective functions, it does not aggregate benefits and costs into a single index, and the method excludes the consideration of opportunity costs.

While Brandl does not offer practical alternatives, the article is useful as a criticism.

See also Hill's rejoinder to Brandl's criticism.

7) Hill, Morris. "Rejoinder," AIP Journal, XXXIV (March, 1969), pp. 141-142.

This is Hill's rejoinder to John E. Brandl's article, "Comment on the Goals-Achievement Matrix for Evaluating Alternative Plans," AIP Journal, XXXIV (March, 1969) pp. 139-140. Hill addresses himself to the inadequacies of the model as posed by Brandl. He answers questions about the criterion of economic efficiency, linearity of the model, opportunity costs, and the aggregation of costs and benefits into a single index.

8) Hitch, Charles J., and Roland N. McKean, "Efficiency in Using Defense Resources," The Economics of Defense in the Nuclear Age, (Cambridge, Mass.: Harvard University Press, 1967), pp. 105-239.

This item refers to Part II "Efficiency in Using Defense Resources" from the above-mentioned book. The authors describe methods to promote efficiency in military decision-making. They suggest decentralized decision-making and suboptimizing within a framework of incentives and criteria. To promote efficiency, Hitch and McKean also suggest bringing market mechanisms into the institutional environment and more reliance upon quantitative analysis. The authors indicate that economic analysis is a superior technique of evaluation as compared to traditional requirements and priorities approaches. An illustrative example is provided in Chapter 8. Hitch and McKean fully explain certain conceptual problems inherent in using economic analysis. They devote considerable space to problems of appropriate criteria, incommensurables, uncertainty, and time. Their experiences in public sector decision analysis would suggest considerable carry-over to other public sector domains.

9) Hopkins, R. C. "A Systematic Procedure for System Development," IRE Transactions on Engineering Management (June, 1961), pp. 77-86.

"A technique is described for the development of system objectives requirements, specifications, and conceptual design. It is derived from experience with a number of actual systems in the fields of air defense and airborne fire control. The need for precise knowledge of system functional objectives is stressed. A checklist relating to environmental requirements is presented. A seven-step process is described from functional objectives to model and test." (Author)

This article provides an excellent opportunity to learn about differences between "system synthesis" engineering and the more usual writings about "system analysis."

10) Knezevich, Stephen J. "The Systems Approach to School Administration: Some Perceptions on the State of the Art in 1967," Socio-Economic Planning Sciences, II (1969), pp. 127-133.

"Some of the salient administrative activities consistent with systems are clear delineation of objectives; recognition of the dynamic nature of goals and priorities; generation of alternative means for allocating resources; generation of models of the system under study; utilization of quantitatively oriented tools in analysis; and in decision making, and employment of interdisciplinary teams of specialists in problem analysis. Hard data on the implementation of these systems oriented approaches in education are not available as yet.

School administrators in late 1967 were on the threshold of awareness of concepts, vehicles, and procedures related to systems. They have not as yet perceived systems as an approach to better define, comprehend, or resolve perplexing educational issues or operational problems.

Those aspects of school administration most amenable to operations analysis such as transportation, school plant planning and construction, inventory control or food services are less likely to be classified as crucial problems of administrators. The more significant long-range policy problems in instruction, race relations, adapting the institution to change, teacher militancy, or amelioration of social injustices have been considered by too many to be outside the range of quantitative analysis.

Not everyone talking about systems uses the same data base. The systems approach is more likely to flourish where certain conditions prevail. Some pressing improvements in education are needed to create readiness and use of systems." (Author)

11) Kraft, Richard H. P. Education and Economic Growth. Tallahassee, Fla.: Florida State University, 1968.

This reference is composed of a series of articles dealing with concepts relating education to economic growth. The essays are divided into two areas: Planning Education for Economic and Social Development, and Strategies of Human Resource Development. In the former, topics such as economic problems of developing countries are delineated; in the latter, systems analysis in regard to educational planning and organization is among the items covered.

12) Lundin, G. E., and Gordon Welty. "Relevance of a Managerial Decision-Model to Educational Administration." Paper presented at the American Educational Research Association, Minneapolis, March, 1970.

The authors describe some of the inherent weaknesses of the rational or synoptic decision model. These weaknesses limit the model's usefulness in real management situations. They propose, in a theoretical manner, a more realistic model which remedies some of the deficiencies of the synoptic theory while retaining the latter's analytical tools.

13) McNamara, James F. "A Mathematical Programming Approach to State-Local Program Planning in Vocational Education." Oregon: University of Oregon, n. d.

McNamara proposes the use of a linear programming model that would enable state education planners to evaluate decisions concerning the efficient allocation of vocational education funds to local school districts. Essentially, funds would be allocated to maximize the number of graduates that would fill occupational shortages in a specified labor market. The author explains the steps necessary to make this manpower-requirements approach effective. In the final stages of the report, the model is applied to the Philadelphia Labor Market (Pennsylvania counties only). Although the model yields an optimum solution within stated constraints, it does not make the decision. Rather, it allows the decision-maker to be much clearer about the implications of different alternatives.

14) Sisson, Roger L. "Applying Operational Analysis to Urban Educational Systems." Philadelphia: Management Science Center, University of Pennsylvania, January, 1967.

Sisson explains the nature of operational analysis and how it can be applied to a complex system such as an urban school district. The author lists and discusses five stages of operational analysis: system identification, description of the subsystems, processes, flows, and decisions, the development of a computer simulation model (subordinate models, measuring performance attributes and behavior phenomena, are also needed), validation of the model by school tests, and uses of the model to assess system characteristics and policy changes.

Note: Sisson has applied some of his thinking to problems in the Philadelphia School District.

15) Smithies, A. Government Decision-Making and the Theory of Choice. Santa Monica, Calif.: Rand Corporation, 1964.

The author presents a cost-effectiveness theory based on indifference curves. His article highlights many theoretical problems which are often not faced by analysts when they attack real problems.

2.4 Cost-Effectiveness Analysis

1) Chuang, Ying C., and John B. Peper. "The Philadelphia Model for Title I Evaluation." Philadelphia: School District of Philadelphia, April, 1969.

The authors describe the development of an evaluation model for Title I projects in the Philadelphia School System. The evaluation model has two major divisions: an individual project evaluation model, and an overall cost-effectiveness model. The latter was formulated so that meaningful comparisons could be made among projects. The authors present a theoretical discussion of each section of the evaluation model.

This annotation also appears in section 2.1.

2) Fox, Peter D. "A Theory of Cost-Effectiveness for Military Systems Analysis," Journal of the Operations Research Society of America, XIII (March-April, 1965), pp. 191-201.

"This paper presents a theoretical basis for cost-effectiveness analysis. It is argued that, frequently, a range of effectiveness or cost levels may be acceptable to whoever must ultimately decide which military system (if any) should be acquired. The function of the analyst is to present a schedule of alternatives and not to optimize in the sense that he recommends the selection of a particular alternative. The formulation of the schedule is discussed where the cost and effectiveness associated with each alternative are viewed as random variables. The paper concludes with some general observations relating to military system selection." (Author)

Fox's article treats some very general theoretical aspects of cost-effectiveness but does little to add to such prescriptions as "select the action which is expected to yield the highest return for a given level of cost."

3) Heuston, M. C., and G. Ogawa. "Observations on the Theoretical Basis of Cost-Effectiveness," Journal of the Operations Research Society of America, XIV (March-April, 1966), pp. 242-266.

"This paper presents some observations on the theoretical foundation of cost-effectiveness analysis. It describes the results of continuing research to develop a comprehensive and rigorous description of the important elements of cost-effectiveness as used by the aerospace industry for military and commercial systems planning. The primary objective is to utilize basic mathematical and statistical theory to construct the rules, properties, and hypotheses that are needed to satisfy the contractual requirements imposed by various government customers." (Author)

4) Peper, John B. "Summary of Program Relevance Evaluation Model." An Address prepared for the American Educational Research Association, Minneapolis, March, 1970.

This paper may be viewed as a companion to the paper by Ying Chuang and Peper. The major purpose of Peper's paper is to report the development and use of the model in Philadelphia rather than a detailed description of the model itself. The discussion treats the assignment of priorities, in the form of relative weights, to projects.

Peper concludes that the model appears to be useful in program planning and in making new funding decisions.

This annotation also appears in section 1.3.

5) Planning for Educational Development in a Planning, Programming, Budgeting System. Washington, D. C.: National Education Association, 1968.

This article (pages 39-46) is included to indicate how cost-effectiveness analysis was applied to child care programs. The author's planning process included generating a series of optional programs, formulating measures of progress toward satisfying the objective, quantifying the programs, in terms of effectiveness measures and assessing the additional cost implied by optional programs. The author clearly demonstrates the types of information that have resulted from this analysis. The author suggests that the same type of analytical approach could be used for similar full-scale approaches.

(See also section 2.2 for the annotation of Mushkin and Cleaveland's article "Planning for Educational Development in a Planning, Programming, Budgeting System," found in Interdependence in School Finance: The City - The State - The Nation.)

6) Temkin, Sanford. "A Comprehensive Theory of Cost-Effectiveness." Philadelphia: Research for Better Schools, Inc., April, 1970.

The author notes two deficiencies that stem from contemporary cost-effectiveness methods. Each technique suffers from a lack of a firm theoretical base of assumptions, and an absence of a means for selecting an efficiency technique for a practical problem. This paper is intended to correct these inadequacies and to appeal to the mathematically-trained person who is interested in a general theory of school system planning and in methods such as cost/benefit and cost-effectiveness analysis. Temkin presents a theoretical development of 9 decision cases in an evolutionary framework ranging from the simplest decision-making situation (Case 1) to complex circumstances faced by school administrators (Cases 8 and 9). The cases are augmented by mathematical proofs. In addition, the author discusses his rationale for recommending the use of cost-effectiveness for school district comprehensive planning rather than benefit/cost analysis.

This annotation also appears in section 2.1.

7) Technomics, The Feasibility of Cost-Effectiveness Analysis for Title I Public Law 89-10, Santa Monica, Calif.: Technomics, Inc., 1966.

This report describes one of the earliest practical applications of cost-effectiveness technology to school systems. The school systems of 12 cities were studied with regard to their expenditure of Title I funds. Within this volume are provided a general background of cost-effectiveness, the development and reasoning underlying the methodology used, some survey findings from the impact of Title I, some needed modifications in cost-effectiveness methods to make them more applicable to school systems, and a workable PPBS tool for education. The authors conclude that cost-effectiveness can be applied to educational expenditures, provided some modifications are made in its technology.

8) Zabronsky, Herman. "A Mathematical Theory of Cost-Effectiveness," Socio-Economics Planning Sciences, I (September, 1967), pp. 3-18.

"Planning-programming-budgeting systems are applied where more precise comparison of alternate plans and programs is desired than can be achieved by traditional methods. Cost-effectiveness analysis is used to make such comparisons by relating resource input and useful output of a program relative to stated planning goals. Proper application of the techniques of cost-effectiveness depends on their mathematical foundation. In this paper a rigorous mathematical theory of cost-effectiveness, based on the Gradient Method, is formulated and developed. Computation of cost-effectiveness measures is considered and procedures for determining optima are derived." (Author)

2.5 Input-Output Analysis

1) Dyer, Henry S. "The Concept and Utility of Educational Performance Indicators." Paper presented at the Systems Science and Cybernetics Conference, Boston, October, 1967.

The author describes a technique for the development of educational performance indicators based upon regression analysis. A theoretical model is presented to the reader with suggestions and interpretations of its use. Possible problems of implementation are discussed. Finally, Dyer implies that educational performance indicators may "provide a basis for genuine cost-benefit analysis."

This annotation also appears in section 1.4.

2) Kershaw, J. A., and R. N. McKean. "Systems Analysis and Education." Santa Monica, Calif.: Rand Corporation, 1959.

This was one of the first articles suggesting input-output analysis for educational decision-making.

3) Levin, Henry M. "A New Model of School Effectiveness." Stanford, Calif.: Stanford University, May, 1970.

"In recent years there has emerged a number of large-scale statistical studies exploring the effects of schools on achievement. In virtually all cases these studies explored the relationships between a single output on the one hand, and student and school characteristics on the other. Such an approach can not take into account the fact that schools produce several outputs simultaneously.

In this effort schools are viewed as multiproduct firms that add to the "capital embodiment" of children, in turn affecting their skills and attitudes. A four-equation system is posited for determining simultaneously the effects of school and other variables on sixth graders' verbal achievement, sense of efficacy, grade level aspiration, and parents' educational aspirations for their children. The model is estimated for some 600 sixth graders in a large eastern city. One of the important findings is the suggestion that earlier studies may have over-stated substantially the direct effect of background characteristics on scholastic achievement." (Author)

4) Miller, Richard I. "A System Analysis of Education in Kentucky Public Schools." Paper presented at the American Educational Research Association's Annual Meeting, Chicago, February, 1968.

The purpose of this article is to analyze the relationships between school variables, both individually and in combinations. Multiple regression analysis was employed to examine the relationships among socio-economic (input) factors, instructional (process) factors, and several measures of student achievement (output). Nineteen factors were considered. Miller lists the 12 findings of the study

and provides an explanation of results. Although the author states that the Kentucky study may not be applicable to other states, some of the findings do not substantiate preconceived notions of relationships among variables.

5) Mood, Alex M. "Macro-Analysis of the American Educational System," Operations Research, XVII (September-October, 1969), pp. 770-784.

"This paper presents a rudimentary model of the public school system as an input-output process. The inputs are students' own abilities and attitudes, parental support, peer support, quality of the school system, community support, and society's posture with respect to education. Outputs are various categories of academic achievement as well as social competence, responsibility, self confidence, creativeness, ethics, and ambition. All these factors must be measured by index numbers or simple indicators. The model is a set of regression equations relating outputs to inputs. Some implementation of the model has been made possible by means of data gathered in the U. S. Office of Educations's Equality-of Educational-Opportunity Survey." (Author)

This annotation also appears in section 1.4.

6) Mort, Paul R., and Orlando F. Furno. Theory and Synthesis of a Sequential Simplex: A Model for Assessing the Effectiveness of Administrative Policies. New York: Teachers College, Columbia University, 1960.

This monograph represents one of the first "input-output" methods in the literature of educational administration. The monograph presents the theory of Sequential Simplex, its associated models and practical applications for school administrators. Essentially, the model attempts to control gross differences that exist between school systems (wealth, size, population, board policy and personnel) in order to focus its attention on overlooked subtle differences (administrative policy, legal structure and organization). The authors describe how a given factor (input), in its interplay with others, affects the quality (output) of the system. Furno and Mort list and describe 11 steps for the measurement of the impact of a factor. Definitions and statistical methods are contained in supplements to the monograph.

2.6 Cost/Benefit Analysis

1) Hamburg, Morris. "Statistical Decision Theory and Benefit-Cost Analysis for Preferredness of Choice Among Alternative Projects," Psychology of Management Decision, (1967), pp. 44-60.

"The purpose of this paper is to suggest a [general] model which combines benefit/cost analysis with statistical decision theory,

particularly for public expenditure decisions." By adapting Bayesian statistics to the traditional model of benefit/cost analysis, the resulting method is able to handle problems such as postponability of investment, uncertainty and interdependence of projects. In the final sections of the article, Hamburg proposes that the opportunity cost of a project be used as the discount rate.

2) McKean, Roland N. "Special Problems in the Analysis of Water-Resource Projects," Efficiency in Government Through Systems Analysis, David B. Hertz, editor (New York: John Wiley & Sons, Inc., 1965), pp. 103-182.

This item refers to Part III, "Special Problems in the Analysis of Water-Resource Projects." McKean discusses criteria in the selection of water-resource projects, kinds of benefits and costs, such as spillovers, over-counting and secondary benefits, and valuation of benefits. The author describes the deficiencies of the traditional cost/benefit ratio measure as a decision criterion. McKean recommends the use of the internal rate of return criterion. He discusses the nature of an appropriate discount rate (not the market rate) and describes how time preferences of decision-makers can alter optimum decisions.

In viewing types of benefits and costs, McKean recommends that technological spillovers, but not pecuniary effects, be included in project analysis. In addition, secondary benefits only arise under situations of previous unemployment. McKean also mentions the treatment of forgone taxes and other miscellaneous double counting that might mislead the analyst.

In the final section of Part III, the author presents a theoretical model as well as practical applications of his methodology for valuing benefits. Examples include cases involving incremental and indivisible amounts of investment.

3) Polin, Lewis. "Benefit/Cost Analysis." Philadelphia: Research for Better Schools, 1968.

This paper assesses benefit/cost analysis from several vantage points: its history, the problems involved in its application, some illustrative examples of its use, and its present role in decision-making.

4) Proposed Practices for Economic Analysis of River Basin Projects, Report to the Federal Inter-Agency River Basin Committee Prepared by the Sub-Committee on Benefits and Costs (Washington: 1950).

This booklet is often referred to as the "green book." It is one of the first practical treatments of "what to do" in analyzing benefits and costs for public sector projects.

In discussing criteria at the project level, the green book suggests the criterion of maximization of net benefits for comparing different projects.

3.0 SYSTEM CHARACTERISTICS AND QUALITIES

3.1 Feasibility

1) Caldwell, Michael S. "An Approach to the Assessment of Educational Planning," Educational Technology, (October, 1968), pp. 5-12.

This article provides a framework assessing the overall feasibility of alternative plans. A full explanation of illustrative evaluative criteria is presented.

2) Dror, Yehezkel. "Systems Analysis for Development Decisions: Applicability, Feasibility, Effectiveness and Efficiency." Santa Monica, Calif.: Rand Corporation, August, 1969.

Dror suggests that systems analysis is not adaptable to all levels of problems. He proposes a meta-analysis (an analysis of the cases where system analysis is most effective). He presents a schema showing the degrees of applicability of feasibility in using system analysis in eight problem areas, one of which is education. In general, he concludes that system analysis is more useful for low or medium-level decision-making or in suboptimizing cases of higher-level problems.

This annotation also appears in section 2.3.

3) Friedly, Philip H., et al. "Benefit-Cost Applications in Urban Renewal: A Feasibility Study." Clearinghouse for Federal Scientific and Technical Information Contract #182969, Bethesda, Md.: Resource Management Corporation, August, 1968.

This item refers to Chapter 6, "Evaluating the Impacts of Renewal Activities," of this report. A matrix is developed showing the interactions between 11 urban renewal objectives and 11 welfare indicators. Measuring these 11 welfare indicators would yield information regarding the attainment of the specified objectives. Nevertheless, in their discussion of each of the welfare indicators, the authors point out that the criteria are not necessarily commensurable. Empirical testing must now provide information about usefulness and administrative costs for the respective indicators.

This annotation also appears in section 1.4.

4) Hodgkinson, Christopher. "Organizational Influence on Value Systems." Paper presented at the American Educational Research Association Annual Meeting, Minneapolis, March, 1970.

"This paper examines the relationship between organizational climate as operationally defined by A. W. Halpin and the values held by teaching staffs and administrators. Values are measured empirically on the instrument developed by W. A. Scott, author of Values and Organizations. The purpose is to explore the ways in which values, through the mediating factor of perception, are related to organizational climate and to test a number of hypotheses and questions bearing on this relationship: e.g. Do values change as a result of promotion in the hierarchy?

The position is developed that organizations do in fact influence individual value systems although the influence is bifid and interactional. The empirical research suggests a theory of "organizational value" which can be outlined in brief.

The validity of the OCDQ* instrument is challenged. This instrument is still being employed in a variety of research projects and its use may be inadvisable. The exploration of the values/organization relationship is especially pertinent to education considered as a value propagating institution." (Author)

*Note: OCDQ refers to the Halpin Organizational Climate Description Questionnaire. "Such an instrument yields a measure of eight dimensions of social perception on the part of members of an education organization. Four of these measures have to do with inter-staff perceptions (Intimacy, Disengagement, Esprit, Hindrance) and four have to do with staff perceptions of the administration of the organization (Thrust, Consideration, Aloofness, Production Emphasis)." For a fuller discussion of this scale, see Halpin, A. W. Theory and Research in Administration (1966).

3.2. Management Information Systems

1) A Study Design for a Comprehensive Planning Program in the Denver Region. Clearinghouse for Federal Scientific and Technical Information Contract #6808. Denver: Denver Regional Council of Governments, December 1968.

This item specifically pertains to the fourth chapter of the Denver Regional Council of Governments comprehensive plan. This chapter discusses the development of a system for managing those studies that are to be used as inputs to the overall planning process. Included

are descriptions of manpower and cost requirements, programming and scheduling of activities, implications with respect to organization, and the development of a management information system.

This annotation also appears in section 1.5.

2) Bratten, J. E., L. T. Krebs, and F. A. Yett. "The Development of a School District Budget Planning System." Santa Monica, Calif.: System Development Corporation, May, 1968.

"The design and initial trial phases of a project to develop SPLAN (pronounced "es-plan") -- a computer-based planning system for school districts -- are reported in this document. The work described was accomplished during the period 1 March 1967 through 29 February 1968.

An initial version of SPLAN was made available to administrators at Charter Oak Unified School District from May 1967 until the present. SPLAN offers the user two capabilities: from a teletype at the district office linked to a computer at System Development Corporation, the user can retrieve specific portions or summaries of a prestored description of his personnel; in addition, the user can prepare alternative budgets at the teletype by modifying factors such as the salary base, salary schedule, etc.

Analyses of data and observational notes indicate the need for two revisions to SPLAN. One is to incorporate SPLAN more directly into the budget planning cycle by regularly providing information to administrators. The other is to delete the interactive (teletype) capability; administrators making planning decisions can readily tolerate several days' delay in obtaining the results of those decisions." (Author)

3) Brooks, Elizabeth A. (ed.) MSEIP Documentation of Project Development and General System Design. Des Moines, Iowa: Midwestern States Educational Information Project, 1969.

The Midwestern States Educational Information Project (MSEIP) was a combined effort of 13 state educational agencies (SEAs) to develop and implement an integrated information system, which reflected the need for timely and accurate information for decision-making. The organizational structure of the Project was significant in that an active working relationship was established between the Federal Government, SEAs and local educational agencies. (Taken from Forward of report)

4) Cummings, Peter C. "A Review and Analysis of Decision Making with a View Toward a Comprehensive Management Information System." Philadelphia: Research for Better Schools, May, 1970.

This paper is addressed to decision-making and decision-analysis in connection with Integrated Municipal Information Systems (IMIS). Sections are devoted to categories of decisions, decision process models, decision-tree analysis, and decision analysis methodology.

5) Guertin, Wilson H. "Straight Talk About Computer Information Systems," Educational Technology, IX (1969), p. 25.

This article describes the nature of computer information systems and some of the difficulties arising from their implementation in educational environments. Guertin defines four types of information systems: a management information system (for sound decision-making), a pupil information system (to improve teacher-pupil situations), a guidance information system (for pupil understanding), and a total information system. Furthermore, the author states that educators must make a commitment to the information system's overall design both as to "software" and "hardware." Guertin recommends that existing systems improve standardization and uniformity, that the Federal government fund software development, and that schools and universities combine to implement total information systems.

6) Sandberg, John (ed.). Schools and Comprehensive Urban Planning. Portland, Oreg.: Northwest Regional Educational Laboratory, September, 1969.

The purpose of this document is to provide ideas that will help school administrators work more effectively with local, state and regional planning bodies. The authors stress the urgency for comprehensive, interagency planning in urban areas. A series of articles examine some aspects of integrative, cooperative planning. For example, John Sandberg's article assesses some of the problems that beset agencies that try integrative planning. In an article entitled, "Urban Planning Objectives," the authors list certain "do's and don'ts" for involving citizens in the planning process. They also state that the quality of public participation depends largely on the people's access to facts and ideas. The latter two articles by Hansen and Musoff discuss planning models (types of and strategies used to bring about change) and the stages in the development of an information system for urban areas.

This annotation also appears in sections 2.1 and 4.1.

7) Yarbrough, Everett L. "The Florida Plan for a Statewide Education Management Information System," AEDS Journal, III (September, 1969), pp. 1-9.

The author states that there is a need for a management information system for Florida. The Florida Educational Management Information System (FEMIS) has been recommended to the state legislature for implementation. The system would provide an uninterrupted flow of information among all educational agencies within the state.

3.3 Feedback

1) Automatic Control. New York: Simon and Schuster, 1955.

This series of 12 essays represents one of the earliest attempts to provide "a comprehensive picture of the unifying, essential principles of automatic control." For example, in his essay "feedback," Tustin views feedback as the common pattern that underlies the various phenomena of life. Ayes, Pease, and Lessing discuss the automatic chemical plant, machine tool, and office, respectively. In the final sections of the book, King considers how information can be expressed in mathematical terms, while in an article entitled "The Mathematics of Information," Weaver shows how the property of entropy and laws of thermodynamics can be applied to communication concepts.

2) Forrester, Jay W. "A Deeper Knowledge of Social Systems," Ekistics, XXVIII (April, 1969), pp. 360-367.

The author suggests that complex social systems can be viewed through the use of two variables (levels and rates) and the resulting feedback generated. Furthermore, he states that computer-oriented models, based upon level and rate schematics, should be used to replace unreliable, intuitive judgments. Some effort is expended in describing the development and use of a complex, urban simulation model. In addition, Forrester includes policy changes in the model and concludes that many present day policies may be detrimental to a city.

This annotation also appears in section 2.3.

3.4 Organization Structure

1) Andes, John, Roe L. Johns, and Ralph B. Kimbrough. Alternative Models for Organization and Administration of Urban School Systems, Working Paper #4, U. S. Office of Education Research Project #8-0254. Gainesville, Fla.: University of Florida, February, 1970.

This article focuses on two basic areas of U.S.O.E. Research Project #8-0254 (University of Florida). This report describes in depth some existing models of urban school organization, and it also provides an extensive discussion of alternative organization and administrative models for urban school systems. Three bureaucratic urban school organizational models (consolidation, centralization and decentralization) are treated and their sub-types. Alternative models discussed include the pluralistic models (Federal, Egalitarian, PPBS). Comments indicating some of the justification and necessary conditions for their implementation are also provided. Finally, the report deals briefly with the establishment of better community-school communication. A mechanism called the System Spanning Unit serves to provide this communication interface.

This annotation also appears in section 4.1.

2) Abbott, Max G. "The School as a Social System: Indicators for Change," Socio-Economic Planning Sciences, II (1969), pp. 167-174.

"In systems analysis, the school may be viewed as a functionally differentiated subsystem of the broader social system in which it is embedded. To maintain a viable relationship with that social system, the school is subject to continual changes to meet the shifting social, economic, political, and technological forces in its environment. However, the more successful the school organization is in accurately assessing changing environmental forces, and in making appropriate adjustments to those forces, the more successful will it be in resisting temporary pressures and transitory movements and in controlling its own directions.

A major research problem is to identify those organizational properties that enable the school to assess accurately new demands and to adjust appropriately to those demands. Theoretically, those properties might be expected to include: 1) operationalized statements of instrumental goals; 2) a work structure that involves interdependence in task performance; 3) participation in decision making; 4) an incentive system that utilizes performance criteria rather than expressive relationships; 5) personnel practices that encourage a cosmopolitan orientation; and 6) institutionalized provisions for change advocacy.

The specification of the relationships among these properties, or variables, and the determination of means for assessing them quantitatively, are tasks that remain to be accomplished." (Author)

3) Baker, Walter. "Management by Objectives: A Philosophy and Style of Management for the Public Sector," Canadian Public Administration, XII (Fall, 1969), pp. 427-443.

This article assesses the suitability of "management by objectives" for both private and public sectors. Baker lists a set of six techniques that can be used for the implementation of "managing by results." Although the author presents some of the dangers or pitfalls that may arise out of management by objectives, he concludes that its adoption would lead to four benefits: more systematic planning, focusing on those objectives that involve problem-solving and creativity, achieving necessary decentralization, and reviewing executive performance.

4) Elam, Stanley, and Gordon I. Swanson (eds.) Educational Planning in the United States. Itasca, Ill.: F. E. Peacock, Inc., 1969.

A series of articles from the Second Symposium on Educational Requirements for the 1970s, An Interdisciplinary Approach held at the University of Minnesota is presented. The essays deal with various aspects of educational planning. Discussions of each of the papers are included.

For example, there is an article by Philip G. Smith entitled "Objectives for American Education," a paper entitled "The Status of Educational Planning in the United States," written by Francis S. Chase and "The Planning Process," by Kjell Eide. In the latter regard, the author explains the functions of an organization, such as programming and implementation, and suggests that organizational structure should be flexible enough to account for the interplay among administrative functions. Furthermore, Eide argues for a separate planning unit which would be able to identify discrepancies that exist between the objectives and policy instruments of separate branches of the organization and those objectives and policy instruments that encompass the entire institution. In the final stages of the article, Eide details a method for minimizing role conflicts and communication distortion that may occur between the executive and planning branches of the organization.

5) Jensen, Gale Edward. Problems and Principles of Human Organization in Educational Systems. Ann Arbor, Mich.: Ann Arbor Publishers, May, 1969.

The major premise of this book is that an effective instructional environment and a productive system characterized by high morale become possible when organizational problems are handled well by school system members. This book is intended to suggest to the school administrator skills that are necessary in dealing with organizational problems. Organizational concepts are presented and case histories are discussed to enable administrators to apply these theories to practical problems. Topics that are discussed by Jensen include socio-psychological factors of an organization, policy considerations, suggestions and methods for implementing change, and indicators of organizational effectiveness. Regarding the latter, the author delineates optimum organizational conditions and demonstrates the effects on organizational indicators if such conditions are violated.

6) Kreitlow, Burton W., and Teresa MacNeil. "The School Board and a Model for Educational Improvement." Madison, Wisc.: Center for Cognitive Learning, University of Wisconsin, April, 1970.

"Important improvements in education usually require gross adjustments throughout the entire school system. The school board is but one of the agents of educational change. Administrators, teachers, and citizens are also major entities in the process. The introduction of improvements in school systems requires knowledge of how change takes place. The authors propose the Model for Educational Improvement as an instrument for describing the process of change in school systems. This model is a composite of ideas derived from the findings of researchers in the fields of agriculture and education and from the author's observations of the change process in five Wisconsin school districts. The model describes the flow of the change process in a school system. It allows for the fact that ideas for improvement may either be supplied to, demanded by, or originated within the school system. It underscores the importance of the role of interaction among all the major entities (school board, administrators, teachers, and citizens) within the system if there is to be optimal commitment to decisions for improvement." (Author)

7) Maguire, Louis M. "Feasibility Study and Analysis of the Administrative Management." Philadelphia: Research for Better Schools, April, 1970.

This report describes a series of recommendations made by Research for Better Schools to the Harrisburg City School District (Pennsylvania). The recommendations focus on an administrative reorganization of the district. This reorganization, hopefully, would provide a framework within which systematic planning could be facilitated.

4.0 POLITICS, COMMUNITY, IMPLEMENTATION AND COMMUNICATION

4.1 Politics and Community

1) Altshuler, Alan A. "The Goals of Comprehensive Planning," The City Planning Process A Political Analysis, (Ithaca, N. Y.: Cornell University Press, 1965), pp. 299-332.

Altshuler suggests that ideal comprehensive planning is a difficult process to effect. Although comprehensive planners profess a special knowledge of the public interest, their stated goals are too general to be evaluated by politicians or the community. Furthermore, the author states that if goals are translated into attainable operational objectives, there is the risk that these less comprehensive statements will not reflect the interests of the entire community. Moreover, he intimates that comprehensive planning may be anti-democratic because it assumes that conflict of interest is either minor or completely reconcilable. Finally, Altshuler questions whether a comprehensive planning approach is superior to a specialized planning framework.

Note: This item refers to Chapter V, entitled, "The Goals of Comprehensive Planning."

2) Andes, John, Roe L. Johns, and Ralph B. Kimbrough. Alternative Models for Organization and Administration of Urban School Systems, Working Paper #4, U. S. Office of Education Research Project #8-0254. Gainesville, Fla.: University of Florida, February, 1970.

This article focuses on two basic areas of U.S.O.E. Research Project 8-0254 (University of Florida). This report describes in depth some existing models of urban school organization, and it also provides an extensive discussion of alternative organization and administrative models for urban school systems. Three

bureaucratic urban school organizational models (consolidation, centralization and decentralization) are treated and their sub-types. Alternative models discussed include the pluralistic models (Federal, Egaliterian, PPBS). Comments indicating some of the justification and necessary conditions for their implementation are also provided. Finally, the report deals briefly with the establishment of better community-school communication. A mechanism called the System Spanning Unit serves to provide this communication interface.

This annotation also appears in section 3.4.

3) Budgeting for National Objectives. New York: Committee for Economic Development, January, 1966.

Since the federal budget could be an instrument for rational policy decisions and a tool for effective management, this report focuses on methods by which these two objectives could be more fully realized. Having analyzed the federal budgetary process in detail, the Committee found these inadequacies in the prevailing system: little attention to long-range planning and program budgeting, insufficient focus on broad organizational objectives that are operational, and ineffective organization of the executive branch for dealing with problems of resource allocation and operational efficiency.

Because the budgetary process requires a close association between the executive and legislative branches, the Committee's recommendations affect both sectors of the government: the federal budget should be program-oriented (the use of PPBS, cost/benefit and cost-effectiveness is suggested), the Bureau of the Budget should be strengthened to establish more effective planning and evaluative procedures, Congress should be given a greater role in evaluating alternative uses of funds, and the General Accounting Office should institute a government-wide financial audit.

4) Callahan, Raymond E. Education and the Cult of Efficiency. Chicago: University of Chicago Press, 1962.

The author questions the validity of the practice by school administrators of adopting business practices and policies in seeking organizational efficiency. Moreover, he discusses the political weakness and vulnerability of schoolmen in comparison to business-industrial groups. In addition, Callahan attacks the educational community for capitulating to whatever demands are made upon them. Finally, he presents evidence showing that such responses do not necessarily provide a method of operation that will meet the needs of the community.

5) Gross, Neal. "Who Applies What Kind of Pressures?" Who Runs Our Schools? (New York: John Wiley & Sons, 1958), pp. 45-61.

In chapter five, the author defines pressure and details descriptions of pressures, sources of pressures and various cross-pressures that are faced by school superintendents and school board members in Massachusetts. He suggests alternative devices (such as the arousal of public opinion) that can be initiated to influence a superintendent's position. Finally, he discusses some methods that would ameliorate the pressures which benefit certain individuals as well as those that influence the school program itself.

6) Kushnick, Louis. "Race, Class and Power: the New York Decentralization Controversy," American Study, III (1969), pp. 201-219.

This article presents a somewhat one-sided description of the school decentralization controversy that evolved in the Ocean Hill-Brownville section of New York City. Kushnick views the situation as an attempt by the powerless (blacks and Puerto Ricans) to gain power from an unresponsive, centralized educational bureaucracy. He traces the arguments of the proponents of decentralization and shows how their efforts met stern, negative responses from both the Board of Education and the United Federation of Teachers.

7) Levin, Peter, and David Donnison. "People and Planning," Public Administration, XLVII (Winter, 1969), pp. 473-479.

This article analyzes the Skeffington Committee Report (England), an inquiry into public participation in town planning. The authors describe the changing social atmosphere under which the report was released. In addition, Levin and Donnison list some basic recommendations of the report. Finally, they focus on some weaknesses inherent in the participation of the public in town planning.

8) Sandberg, John (ed.). Schools and Comprehensive Urban Planning. Portland, Oreg.: Northwest Regional Educational Laboratory, September, 1969.

The purpose of this document is to suggest ideas that will help school administrators work more effectively with local, state and regional planning bodies. The authors stress the urgency for comprehensive, interagency planning in urban areas. A series of articles examine some aspects of integrative, cooperative planning. For example, John Sandberg's article assesses some of the problems that beset agencies that try integrative planning. In an article entitled, "Urban Planning Objectives," the authors list certain "do's and don'ts" for involving citizens in the

planning process. They also state that the quality of public participation depends largely on the people's access to facts and ideas. The latter two articles by Hanson and Musolf discuss planning models (types of and strategies used to bring about change) and the stages in the development of an information system for urban areas.

This annotation also appears in sections 2.1 and 3.2.

9) Tye, Kenneth A. "A Framework for Analyzing Relationships Between Public Demands and School Board Decisions." Paper presented at the Annual Meeting of the American Educational Research Association, Minneapolis, March, 1970.

This report describes actual interactions between the public and its school board. The author refers to a structural-functional systems framework devised by David Easton and Gabriel Almond to show how political science theory applies to educational decision-making units. Tye describes this framework, applies it to data from a large urban school district and offers some implications and guidelines for future research in assessing the relationship between the school board and its environment.

10) Vanecko, James J., et al. Community Organization Efforts, Political and Institutional Change, and the Diffusion of Change Produced by Community Action Programs. Clearinghouse for Federal Scientific and Technical Information Contract #PB188692. Chicago: University of Chicago, December, 1969.

The purpose of this report is to assess characteristics which determine the effectiveness of Community Action Agencies (CAAs) in influencing other institutions to become more responsive to the needs and demands of the poor. The institutions included were public school systems, private welfare, employment, and community-political agencies. Response changes from these institutions were measured using gamma correlation coefficients to determine if the CAA's had had significant influence. A full explanation of the statistical measures are included in the report.

The CAA's were organized into three distinct goal patterns: social service and educational orientation (tradition), community organization and mobilization orientation, and employment orientation. It was found that community organization and mobilization structure consistently showed the strongest association with institutional change. Regarding the public schools, when CAA community organization emphasis is processed through neighborhood activity, residents are mobilized to work with the PTA and other community groups to press for change and thus strengthen already present citizen pressure activity. When this citizen pressure is further activitated, change is more likely to occur.

11) Wildavsky, Aaron. The Politics of the Budgetary Process. Boston: Little, Brown and Co., Inc., 1964.

The purpose of this book is to describe and evaluate the budgetary process. The first chapters of the book are devoted to the kinds of calculations and types of strategies that are used by participants in the budgetary process to accomplish their purposes. Budgeting is characterized as being incremental, sequential, fragmentary, etc. and not possessing rational techniques such as cost/benefit analysis and PPBS. In fact, Wildavsky later claims that PPBS represents concepts that are completely contrary to the concepts of traditional budgeting. Furthermore, he states that budgetary reforms should be aimed at the political system which the budget expresses. Reforms that alter only the budget instrument are insufficient. In the concluding sections of the book, Wildavsky proposes that the present budgetary system works far better than is thought and he examines this hypothesis through concepts such as comprehensiveness and coordination that occur in present day budgeting. The appendix offers the reader a detailed description of the budgetary process.

12) Wildavsky, Aaron. "The Political Economy of Efficiency," The Public Interest (Summer 1967), pp. 30-48.

Wildavsky proposes a policy analysis technique as an alternative to PPBS. He analyzes and compares experiences of the Defense Department and domestic agencies with PPBS. He concludes that PPBS has been damaging to prospects for improved policy analysis at the federal level. Finally, he suggests ways to facilitate better policy analysis.

This annotation also appears in section 2.2.

13) Wildavsky, Aaron. "Rescuing Policy Analysis from PPBS," Public Administration Review (March-April, 1969), pp. 189-202.

Wildavsky examines economic efficiency techniques (cost/benefit analysis, systems analysis, and program budgeting) in order to assess whether or not these methods achieve efficiency. The author suggests that efficiency is a function of the political system as well as of economizing within the system. He concludes that both cost/benefit analysis and systems analysis promote "mixed" efficiency while minimally modifying the political system. On the other hand, program budgeting is a function of policy politics. Wildavsky concludes that economic efficiency techniques must not overlook the affects of political costs and benefits of change.

14) Wilder, David E., et al. Actual and Perceived Consensus on Educational Goals Between School and Community. U. S. Office of Education Project #5-1067-2-12-1. New York: Columbia University, December, 1968.

This report discusses the goals of education as seen by mothers of students, teachers, and students. The goals used in this study were excerpted from Downey's Tasks of Public Education (see section 1.2). The essential purpose of this report is to assess the effects that actual and perceived differences in goals between the participants have on the social environment of the school. Although consensus about educational goals among mothers, teachers, and students is not significantly high, the authors list and describe several reasons for the continued survival of schools.

4.2 Implementation

1) A Program to Introduce Improved Management Methods in Hawaii State Government: A Planning-Budgeting System. A Review and Evaluation of the First Year of Implementation, Central Analysis Group, Office of the Governor, Clearinghouse for Federal Scientific and Technical Information Project #P-20. Springfield, Va.: Department of Planning and Economic Development, March, 1969.

The purpose of this effort was to improve the effectiveness of state planning and to assure that program plans become the basis for program decisions. Volume I forms the basic framework for a four volume report. A detailed description is provided of this task-oriented endeavor. The planning approach was designed to permit an evolution from descriptive and historically-based reports to those which were both analytical and forward-looking. Decentralized program planning allowed PPBS to be regarded as a logical outgrowth of existing trends rather than as a completely new technique which might have negatively affected the employee climate.

2) Benton, J. B., and A. J. Tenzer. "Program Budgeting and Executive Commitment." Santa Monica, Calif.: Rand Corporation, July, 1969.

The authors' intention is to deal with issues that arise when attempts are made to implement program budgeting within solidly entrenched bureaucracies. The paper is not about program budgeting concepts, but rather it concerns strategies that can be adopted to bring about organizational change required for program budgeting. In describing the problems of implementation, the authors cite the case of the New York City Police Department as

an example. They devote considerable attention to the need for an evolutionary process of implementation and the necessity for multiple channels of communication.

This annotation also appears in section 4.3.

3) Cook, Desmond L. "A Generalized Project Management System Model." Columbus, Ohio: Ohio State University, Educational Program Management Center, November, 1968.

The author presents a generalized project management model intended for the management of educational projects. He identifies the two major components of the project management system as the planning subsystem and the control subsystem. Each sub-function within the two components of the model is described in terms of desired inputs, processes, and outputs. The generalized nature of the model enables it to be adapted to project situations.

4) Croston, J. D., and G. Gregory. "A Critique of Operational Research and Decision-making by Adelson and Norman," Operational Research Quarterly, XX (December, 1969), pp. 415-420.

The authors discuss and criticize a particular operational research and decision-making model and some of its implications. Discussions focus on involving many people within an organization in planning and decision-making.

One of the significant points in the paper is a distinction made between the usual "vertical" information flow within an organization and the "horizontal" information flow needed to plan by objectives.

This annotation also appears in section 4.3.

5) Curtis, William H. "Program Budgeting Design for Schools Unveiled, with Much Work Still to Go," Nation's Schools, LXXXIV (November, 1969), pp. 40-43.

This article presents an interview with William H. Curtis, project director for the Research Corporation of the Association of School Officials, an agency which has undertaken a three-year project to develop a "program planning budgeting evaluation system (PPBES) for local schools." This interview assesses some of the problems and advances of PPBES in the established pilot projects.

6) Eberle, Robert F. "Personnel Management for Change and Innovation in Education," Journal of Creative Behavior, III (Fall, 1969), pp. 277-283.

Eberle demonstrates that involving individuals in decision-making that affects them is a source of motivation. Moreover, the manager who promotes self-confidence and faith in employees contributes to the success of a change effort. The author also suggests that managers study group dynamics to learn how group membership influences change. Finally, Eberle states that change should be initiated by school administrators; change should not come about solely as a reaction to demands or pressures.

7) Foster, Charles W. (ed.). The First National Conference on PPBES in Education. Chicago: Research Corporation of the Association of School Business Officials, 1969.

The Research Corporation of the American Association of School Business Officials has been working on a PPBS design under a USOE multi-year grant. Field efforts are underway in Dade County, Florida, and eight pilot districts throughout the country.

This document includes a history of program budgeting by David Novick of the RAND Corporation and a joint report by William Curtis, project director and John Gott, research associate for the project. The joint presentation describes some of the experience and new thinking resulting from the previous year's field experience.

8) Hartley, Harry J. "PPBS: Economic Strategy for Urban Education," Urban Review, III (1968), pp. 27-29.

The author examines PPBS at the conceptual-descriptive level indicating the major differences between this method and the traditional budgetary process. Hartley reports on the progress of those agencies which have adopted PPBS on a partial scale of operations. The author suggests that two values result from the implementation of PPBS: educators reconsider their priorities based upon program design, and the gap that exists between professed and observed values based upon available resources is displayed.

9) Horvat, John J. "Content and Strategies of Communication in Current Educational Change Efforts." A Paper prepared for the American Association of School Administrators Educational Press Association discussion group on Communication Strategies of Educational Change, February, 1967.

In this report, Horvat examines the content of educational change communication and the communication strategies that are being employed. These two factors form the basis of a two-dimensional schema in which the author evaluates the effectiveness of certain communication devices to types of communication content. He describes five kinds of communication content that he has observed and he assesses the strengths and weaknesses of five common communication media (strategies).

10) Innovations in Planning, Programming, and Budgeting in State and Local Governments. A Compendium of Papers submitted to the Subcommittee on Economy in Government of the Joint Economic Committee Congress of the United States. Washington, D. C.: August, 1969.

This reference is composed of a series of articles each of which describes experience with establishing a PPB System at the federal, state or county level. The articles are case studies dealing with PPBS operations of the national government, California, Michigan, New York State, Wisconsin, Dade County (Florida), Los Angeles County, (California) Metropolitan Nashville-Davidson County (Tennessee), Nassau County (New York), Wayne County (Michigan), and Dayton, Ohio. Included in the case studies are various descriptions of the basic concepts of PPBS, associated program structures and uses of the analytical tools.

11) Knezevich, S. J. "Symposium on Organization and Resource Allocations Required by School Systems Desiring to Implement PPBS." Washington, D. C.: AASA National Academy for School Executives, n. d.

The author recommends a gradual introduction to implement PPBS. He also suggests that the quantity and quality of administrative staff be increased. The author's recent leadership role with the American Association of School Administrator's Academy for School Executives suggests that training may provide a partial answer to this "quantity-quality" gap.

12) Langenbach, Michael. "Development of an Instrument to Measure Teachers' Attitudes Toward Curriculum Use and Planning." Norman, Okla.: University of Oklahoma, 1969.

The purpose of this study was to construct an instrument that would measure the relationship between teacher participation in curriculum use and planning and positive attitude towards school administration. Teachers were selected as study subjects based upon their preconceived ideas towards curriculum use and whether or not they were ever involved in a curriculum planning program. After the respondents' information was tabulated, certain null hypotheses were tested. Study conclusions substantiate the notion that teachers' attitudes are positively affected by participation in a program of curriculum use and planning. Grade assignment and years of experience are two other factors to consider.

13) Maguire, Louis M. "Change Literature and the Practicing School Administrator." Paper presented at a Meeting for the American Educational Research Association Symposium, Minneapolis, March, 1970.

The author's premise is that there is little practical help from the literature for the school administrator in dealing with problems of change. Maguire lists 12 underlying causes which support his major premise. Implicit in this presentation is the point that communication problems between theoretician and user are fundamental and salient.

14) Temkin, Sanford. "Comprehensive Planning for School Districts." Paper prepared for American Educational Research Association Symposium, Minneapolis, March, 1970.

The author feels that current "PPBS approaches" present serious implementation problems for school districts. He provides a methodology for engaging in comprehensive, system-wide planning for school districts. The author contends that an evolutionary installation of the planning mechanism is required because the planning mechanism itself causes a great deal of change.

Once the planning mechanism has been installed information flows can be generated to evaluate the system as it is in order to form a basis for future change decisions.

This annotation also appears in section 2.1.

4.3 Communication

1) Benton, J. B., and A. J. Tenzer. "Program Budgeting and Executive Commitment." Santa Monica, Calif.: Rand Corporation, July, 1969.

The authors' intention is to deal with issues that arise when attempts are made to implement program budgeting within solidly entrenched bureaucracies. The paper is not about program budgeting concepts, but rather it concerns strategies that can be adopted to bring about organizational change required for program budgeting. In describing the problems of implementation, the authors cite the case of the New York City Police Department as an example. They devote considerable attention to the need for an evolutionary process of implementation and the necessity of multiple channels of communication.

This annotation also appears in section 4.2.

2) Croston, J. D., and G. Gregory. "A Critique of Operational Research and Decision-making by Adelson and Norman," Operational Research Quarterly, XX (December, 1969), pp. 415-420.

The authors discuss and criticize a particular operational research and decision-making model and some of its implications. Discussions dwell on involving many people within an organization in planning and decision-making.

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3) Horvat, John J. "Content and Strategies of Communication in Current Educational Change Efforts." A Paper prepared for the American Association of School Administrators, Educational Press Association discussion group on Communication Strategies of Educational Change, February, 1967.

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and he assesses the strengths and weaknesses of five common communication media (strategies).

This annotation also appears in section 4.2.

4) Shannon, C. E., and W. Weaver. The Mathematical Theory of Communication. Urbana: University of Illinois Press, 1949.

This book presents a mathematical theory of communication based on a concept of entropy from a physical law of thermodynamics.

One of the ideas which is treated deals with communication as a function of organization.

5.0 BIBLIOGRAPHY

1) Blue, Richard, et al. Bibliography on Planned Social Change (With Special Reference to Rural Development and Educational Development). Volumes I, II, and III. Government Reports, U. N. Reports and Proceedings of Special Conferences. U. S. Department of Commerce. Minneapolis: University of Minnesota, January, 1967.

This annotated bibliography was prepared in conjunction with the research activities of the CIC-AID Rural Development Research Project. The bibliography covers a wide range of socio-economic research endeavors. Volume I includes periodical materials covered, Volume II deals with books and book-length monographs, and Volume III covers government and United Nations publications and proceedings of specialized conferences.

2) Bowman, Mary Jean. "Economics of Education," Review of Educational Research, XXXIX, (Washington, D. C.: American Educational Research Association, 1969), pp. 641-670.

This review of the literature focuses on selected aspects of macro-economic analysis. Among these are human resource and human capital formation, national-income accounting, aggregative production functions, and a related economic problem currently being labeled as the "economics of education."

A bibliography containing 42 entries is provided.

3) Chartrand, Robert L., and Louise G. Becker. PPBS in 1970: Methodology and Implementation. Washington, D. C.: Library of Congress, April, 1970.

This annotated bibliography presents sources of information which set forth the methodology of PPBS. Included among the 20 articles are governmental directives, congressional hearings, symposia proceedings, reports on governmental experience and other background material. Finally, the bibliography also lists 28 other selections which are not annotated.

4) Directory of Organizations and Personnel in Educational Administration. Eugene, Oreg.: ERIC Clearinghouse on Educational Administration, 1962.

This directory is divided into two sections. The first section is a listing of organizations that includes their areas of specialization, publications, and policies for supplying information to inquirers. The second section is a listing of personnel who are involved in educational administration research.

5) Educational Goals and Objectives in California. Sacremento, Calif.: California School Boards Association, August, 1969.

This report consists of the goals and objectives formulated by 900 school districts of California in conjunction with the California School Boards Association. Distinctions among philosophies, goals, and objectives are described. Eighteen general goal categories have been generated. Also, 51 entries appear in a bibliography on goals and objectives.

This annotation also appears in section 1.2.

6) ERIC Abstracts: A Collection of ERIC Document Resumes on Program Budgeting and Cost Analysis. Series Number Five. Eugene, Oreg.: University of Oregon, American Association of School Administrators, January, 1970.

This annotated bibliography presents 51 entries dealing with problems of economic efficiency particularly in the field of education. The efficiency techniques mentioned include PPBS, cost-effectiveness, cost/benefit.

7) Fishburn, Peter C. "Utility Theory," Management Science, XIV (January, 1968), pp. 335-378.

Approximately 300 entries surveying utility theory are found in the writer's bibliography.

(See also citation in section 1.3).

8) Goals for Public Education in Texas. A Report by the Subcommittee on Goals to the Governor's Committee on Public School Education, U. S. Office of Education. Texas: Operation PEP, December, 1968.

This report traces the historical evolution of educational goals. It is intended as an aid to those educational planners and managers who must translate educational objectives into operational terms. A bibliography of consulted references is attached to the study as well as appendixes which contain goal statements from quoted sources.

This annotation also appears in section 1.2.

9) Judy, Richard W. "Systems Analysis for Efficient Resource Allocation in Higher Education." Canada: University of Toronto, Institute for the Quantitative Analysis of Social and Economic Policy, January, 1970.

A bibliography providing listings of 32 articles and reports available from the University of Toronto is included in the Judy document annotated in section 2.2.

10) Maguire, Robert F. "Planning Approaches in the Public Sector." Philadelphia: Research for Better Schools, June, 1969.

Maguire surveys various efficiency techniques and approaches used in public sector planning (particularly in transportation, water resources, and social services). Consideration is given to PPBS, cost/benefit analysis, cost-effectiveness analysis, etc. in evaluating their inherent strengths and weaknesses for public sector decision-making.

11) McAbee, Harold V. The Oregon Planning Programming Budgeting Systems Institute. Monmouth, Oreg.: Teaching Research Division, Oregon State System of Higher Education, December, 1968.

A section of the final report (pages 78-84) consists of a series of approximately 100 articles, reports, and program memoranda

concerning topics such as PPBS, systems analysis, cost/benefit and cost-effectiveness analysis.

(See also citation in section 2.2).

12) McGivney, Joseph H., and William C. Nelson. Program, Planning, Budgeting Systems for Educators. Volume III: An Annotated Bibliography. Columbus, Ohio: Ohio State University, December, 1969. (ERIC# ED 035756)

"This annotated bibliography is composed of 70 citations relevant for PPBS and ranging in date from 1962 to 1969 but emphasizing the 1965 to 1968 period. Listings are arranged alphabetically according to author under the general divisions: Overview of PPBS, Systems and Administrative Theory, The Planning Process, Program Budgeting and Management Control, Identification and Analysis of Investment Alternatives, Education and Economics, Data and Statistical Analysis, and Limitations of PPBS. An author index is included." (Author)

(See also citation in section 2.2).

13) Piele, Philip K., and David G. Bunting. Program Budgeting for the School Administrator: A Review of Dissertations and Annotated Bibliography. Eugene, Oreg.: ERIC Clearinghouse on Educational Administration, September, 1969.

In this booklet, the authors have synthesized many significant ideas of program budgeting which have arisen from doctoral dissertations. Their purpose is to disseminate this information to school administrators who are considering the possibility of adopting a program budget. Finally, the authors provide an annotated bibliography of the dissertations used in their presentation.

This annotation also appears in section 2.2.

14) Research for Better Schools. An Annotated Bibliography of Benefits and Costs in the Public Sector. (Philadelphia: November, 1968).

This annotated bibliography presents nearly 3,000 entries dealing with problems of economic efficiency in the public sector. Entries deal with techniques such as benefit/cost analysis, cost-effectiveness analysis, operational analysis, PPBS, etc. Particular emphasis is directed to the field of education.

15) Richard, Robert. Subjective Social Indicators. Clearinghouse for Federal Scientific and Technical Information, Contract #PB187944. Chicago: National Opinion Research Center, September, 1969.

An annotated bibliography intended for a survey sponsor or a study director is included (after Chapter IV) as well as a total bibliography of sources used (pp. 185-189).

(See also citation in section 1.4).

16) Stimson, David H. "Utility Measurement in Public Health Decision Making," Management Science, XVI (October, 1969), pp. B-17-B-30.

A bibliography listing 44 items relating to utility and preference measurement is provided at the end of the Stimson article cited in section 1.3.

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